AIRPORT MASTER PLAN

Planning Advisory Group
Meeting #3
January 26, 2021

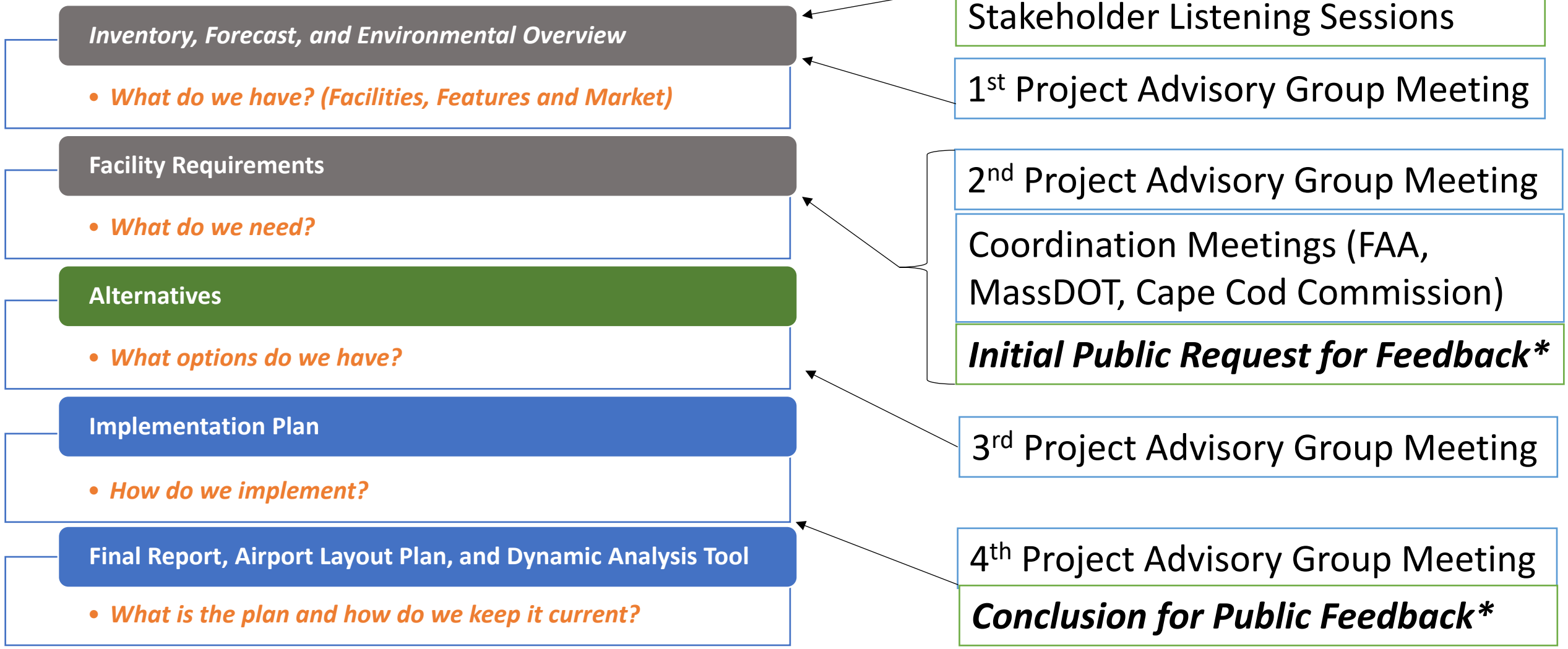
Agenda

- Introductions
- Master Plan Background
- Airside Alternatives
- Terminal Alternatives
- GA and Support Alternatives
- Next Steps

Master Plan Background

Master Plan Goals

Master Plan Process



* Public Feedback is Sought Throughout the Master Plan Project

Project Schedule

Task	Estimated Completion
Inventory	*January 2020*
Environmental Overview	*February 2020*
Forecast of Aviation Demand	*January 2020*
Capacity Analysis and Facility Requirements	November 2020
Alternatives Analysis	January 2021
Financial and Implementation Plan	February 2021
Final Airport Master Plan and Drawing Set	Summer 2021
Deliverables:	
Interim Report 1	*May 2020*
Interim Report 2	February 2021
Draft of Final Report	May 2021
Final Document & ALP	Summer 2021

Meeting	Estimated Schedule
Stakeholder Meetings	*October 2019*
Project Advisory Group Meeting #1	*February 2020*
Project Advisory Group Meeting #2	*June 2020*
Virtual Public Materials Rollout	**October 2020**
Agency Coordination	November 2020
Project Advisory Group Meeting #3	January 2021
Virtual Public Meeting	**March 2021**
Project Advisory Group Meeting #4	March 2021

Updated Public Participation Plan

- Previous Approach:
  - Public Open House with Project Team
  - Comment Forms Available for Inclusion into Master Plan Report

- New Approach (Due to COVID-19):
  - YouTube Channel with Voiced-Over Presentations on Each Topic Area
  - Publicly Sharable Links
  - E-mail Distribution to Stakeholders and Press Release
  - Filmed Response to Comments and Questions Posted Several Weeks Later
  - Virtual Public Meeting (March 2021)

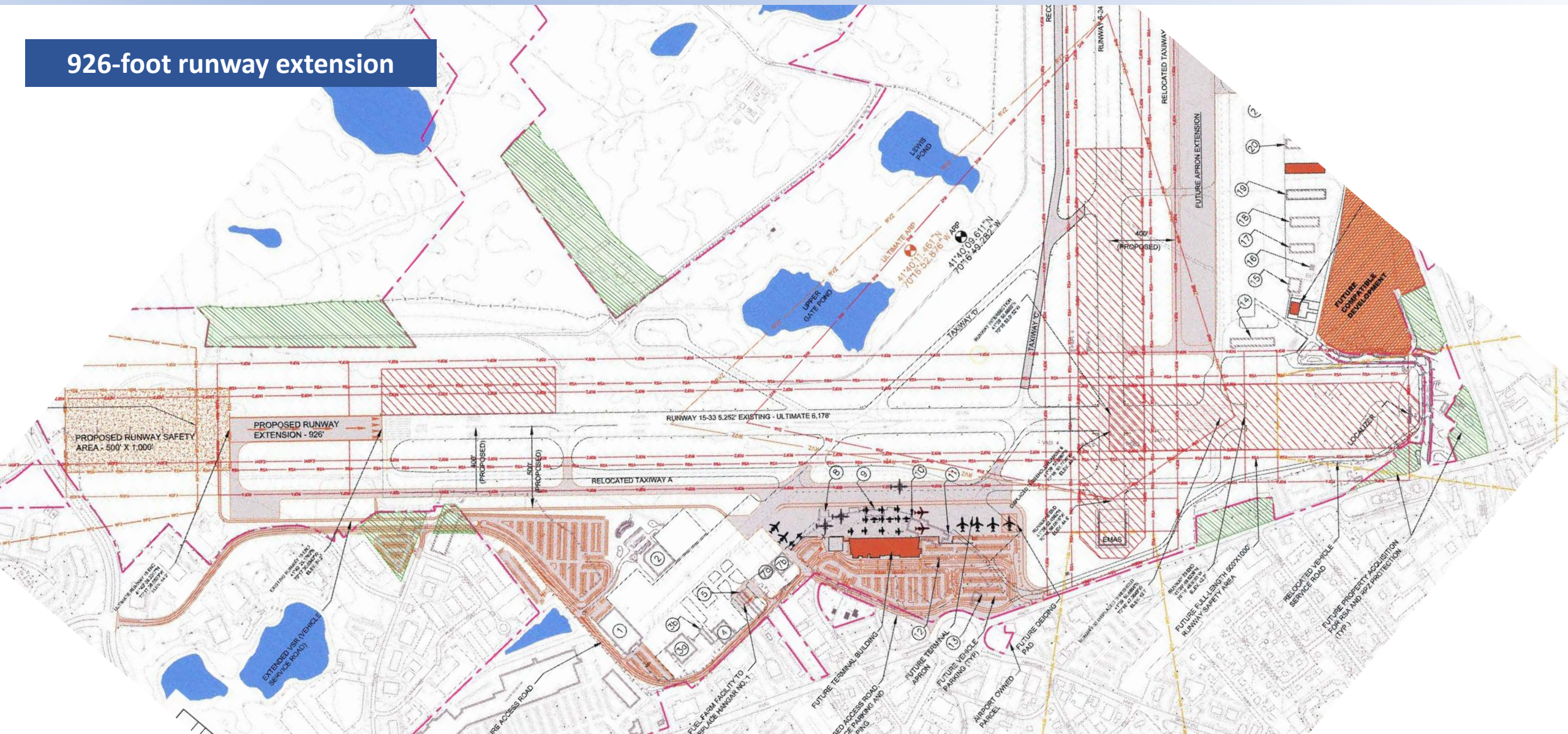
Airside Alternatives

Key Issues

- No Direct Roadway Access
- Validate Previously Proposed Runway 15-33 Extension
- Obstruction Clearance
- Aeronautical Development
- Review Geometry
- Non-Aviation Revenue

Previous Master Plan (2000/2008)

926-foot runway extension



Airside Facility Requirements Summary

Item/Facility	Demand
Runway Length	6,000’ – 6,400’
Runway Safety Areas	Control of All RSA Through Ownership
Runway Object Free Area	Control of All ROFA Through Ownership or Avigation Easements
Runway Protection Zone	Control of All RPZs Through Ownership or Avigation Easements
Runway Visual Aids	Add PAPI to Runway 15 Resolve Runway 15 Threshold Light Separation
Taxiways	Address Airfield Geometry Concerns and Meet FAA Standards
Taxiway Width	Widen Taxiway B
Taxiway Lighting	Add MITLs or Reflective Markers to Taxiway E

Runway Length Recap

- Existing/Short-Term Planning
  - Embraer 190 (Commercial)
  - Airbus A320 (Commercial)
  - Gulfstream V/G500 (General Aviation)
- Future
  - Airbus A220 (Commercial)
  - Gulfstream VI (General Aviation)
  - Global Express (and Similar) Winter (Year-Round GA)
  - Future Regional Airline Fleet Mix (Commercial)

More Year-Round Traffic Will Boost GA Runway Requirements Due to Winter Ops (Wet/Slippery)

With Nearly All Turboprop Aircraft Removed From Regional Airline Fleets, Commercial Airline Aircraft Options to Effectively Serve HYA is Extremely Limited

Both Runways at HYA are the Shortest used by Commercial Jet Aircraft in the Entire Northeast

Runway Length – Potential Operations

		Takeoff (Feet)	Landing (Feet)
Commercial	CRJ-700 – ex. Atlanta	5,915	5,980
	CRJ-700 – ex. DC	5,215	5,980
	Embraer 175 – ex. Atlanta	7,615	5,290
	Embraer 175 – ex. DC	5,515	5,290
	Embraer 190 – ex. Atlanta	7,665	5,175
	Embraer 190 – ex. DC	6,315	5,175
	Airbus A220 – ex. Atlanta	6,365	5,578
	Airbus A220 – ex. DC	5,965	5,578
	Airbus A320 – ex. Orlando	6,015	6,325
	Airbus A320 – ex. Ft. Myers	6,115	6,383
	Boeing 737-800	5,915	6,600
Gen. Aviation	Gulfstream IV[1]	5,395	3,865
	Gulfstream V/G500[1]	6,225/5,265	2,553
	Global 5000[1]	5,115	2,517
	Global Express[1]	5,935	2,519
	Dassault Falcon 900[1]	5,415’	2,645

Larger Aircraft Does Not Correlate to Longer Runway Required

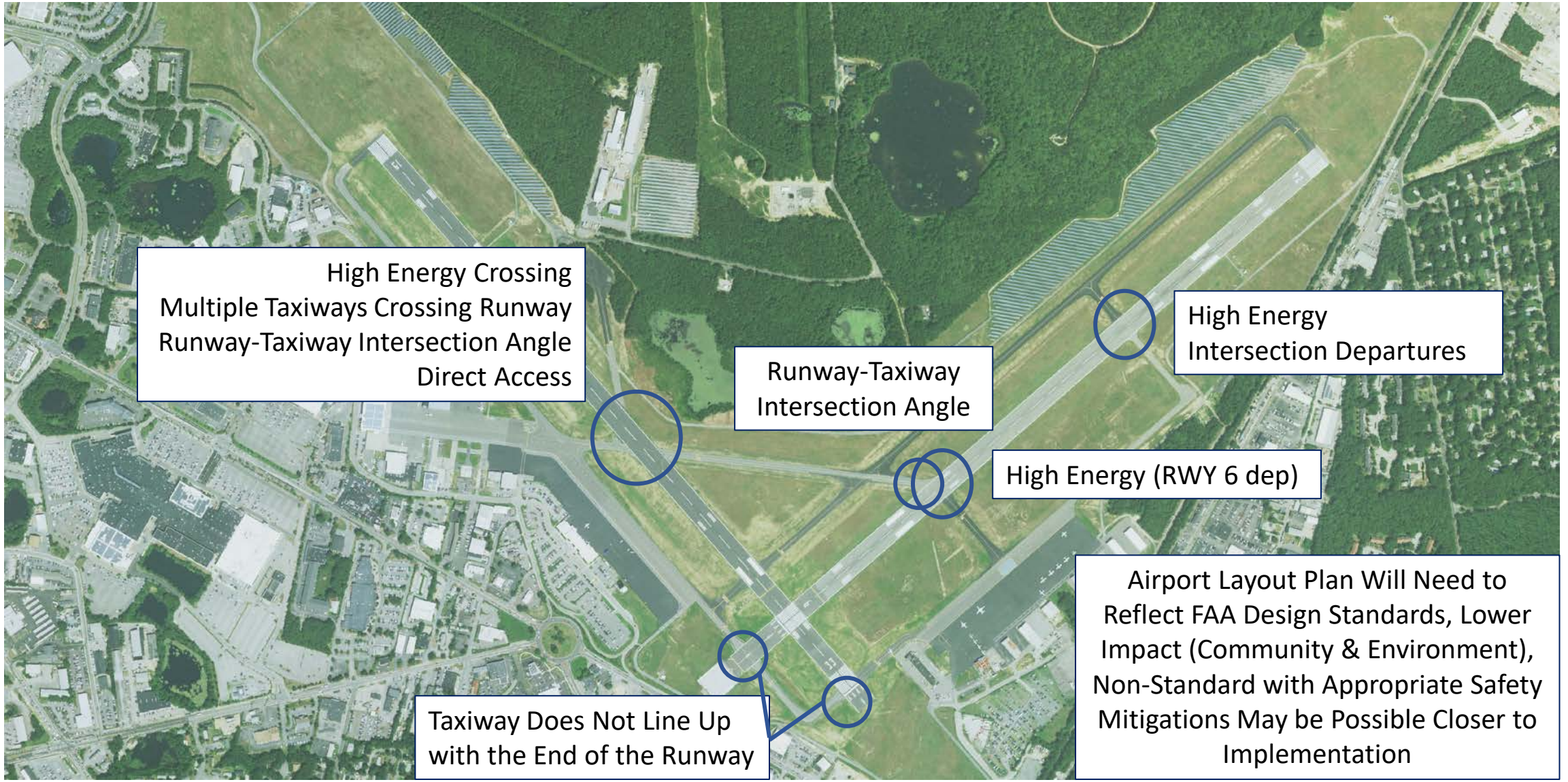
Smaller Aircraft on More Demanding Missions Require More than Short Missions for Large Aircraft

Runway Length Qualitative Perspective

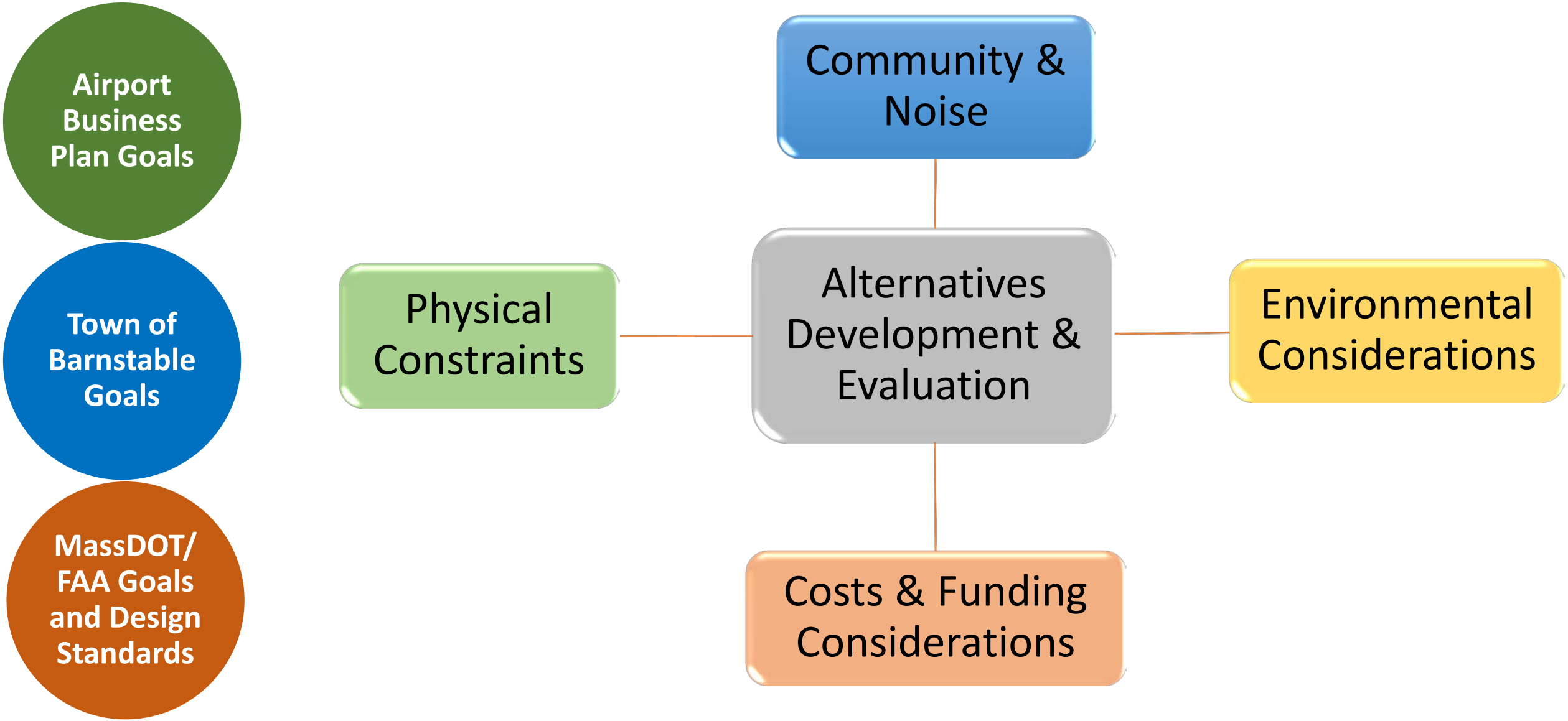
- Airlines are Retiring/Consolidating Fleets
  - Less Flexibility to Optimize Fleet (HYA is Only One Piece of an Airline's Network)
  - Current Runway Length Only Works for very Limited Routes/Aircraft
  - Smaller Aircraft May Need Longer Runway Lengths than Larger Aircraft
- Commercial Service Aimed at Serving Year-Round Cape and Business Needs
  - Over 200 People Travel Off-Cape Daily for Air Transportation Needs
    - Vehicle Traffic, Emissions, Quality of Life
    - Number Doubles when Accounting for Inbound Tourism Market
  - Post Covid Remote Work Environment Could Make Cape More Attractive to Year-Round Residents, Leisure and Most Business Demand for Air Travel will Remain
  - Upcoming Bridge Replacement – Providing Critical Air Link
- Estimated 2-10 Average Daily Operations Would Need/Use Longer 15-33

Over 200,000 Annual Air Trips are Booked by Cape Cod Residents and Businesses, 98.7% Use Other Airports! This Does Not Include Inbound Visitors!

Airfield Geometry Standards



Alternatives Development



Runway Alternatives Process

Identify Critical Runway Length Need

Accelerate Stop Distance Available
Landing Distance Available

Review the Constraints: Generally, Remain Within the Existing Airport Property Due to Community Impacts and Infrastructure Constraints

Alternatives:
With and Without EMAS

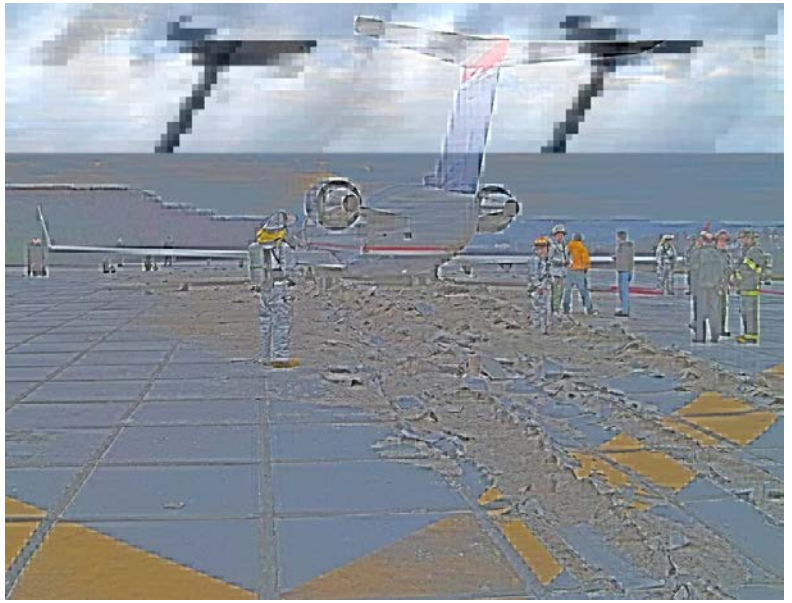
Weighing Pros and Cons

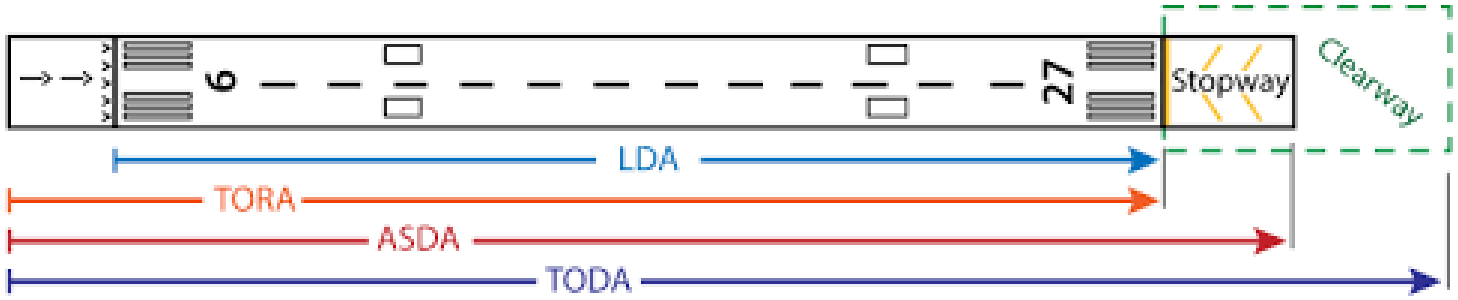
Preferred Alternative and **Potential Changes Will Be Determined Based on Feedback (FAA/MassDOT, Stakeholder, and General Public)**

Next Step: FAA Will Evaluate the Documentation

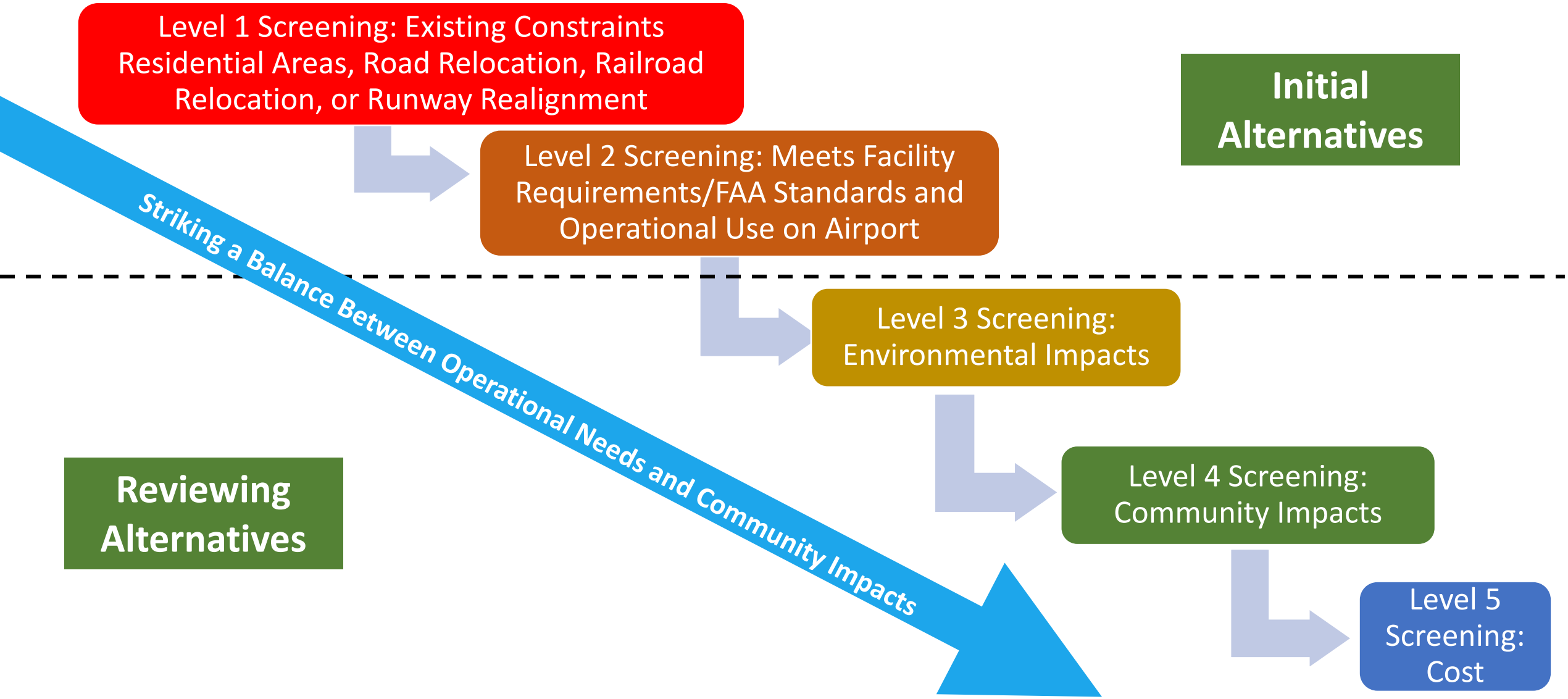
Airside Alternatives – Technical Attributes

- EMAS: Crushable Material Placed at the End of a Runway to Stop an Aircraft That Overruns a Runway, Acceptable Safe Alternative to 1,000 RSA
- Declared Distances – Provide Necessary Safety Buffers While Enhancing Operational Flexibility

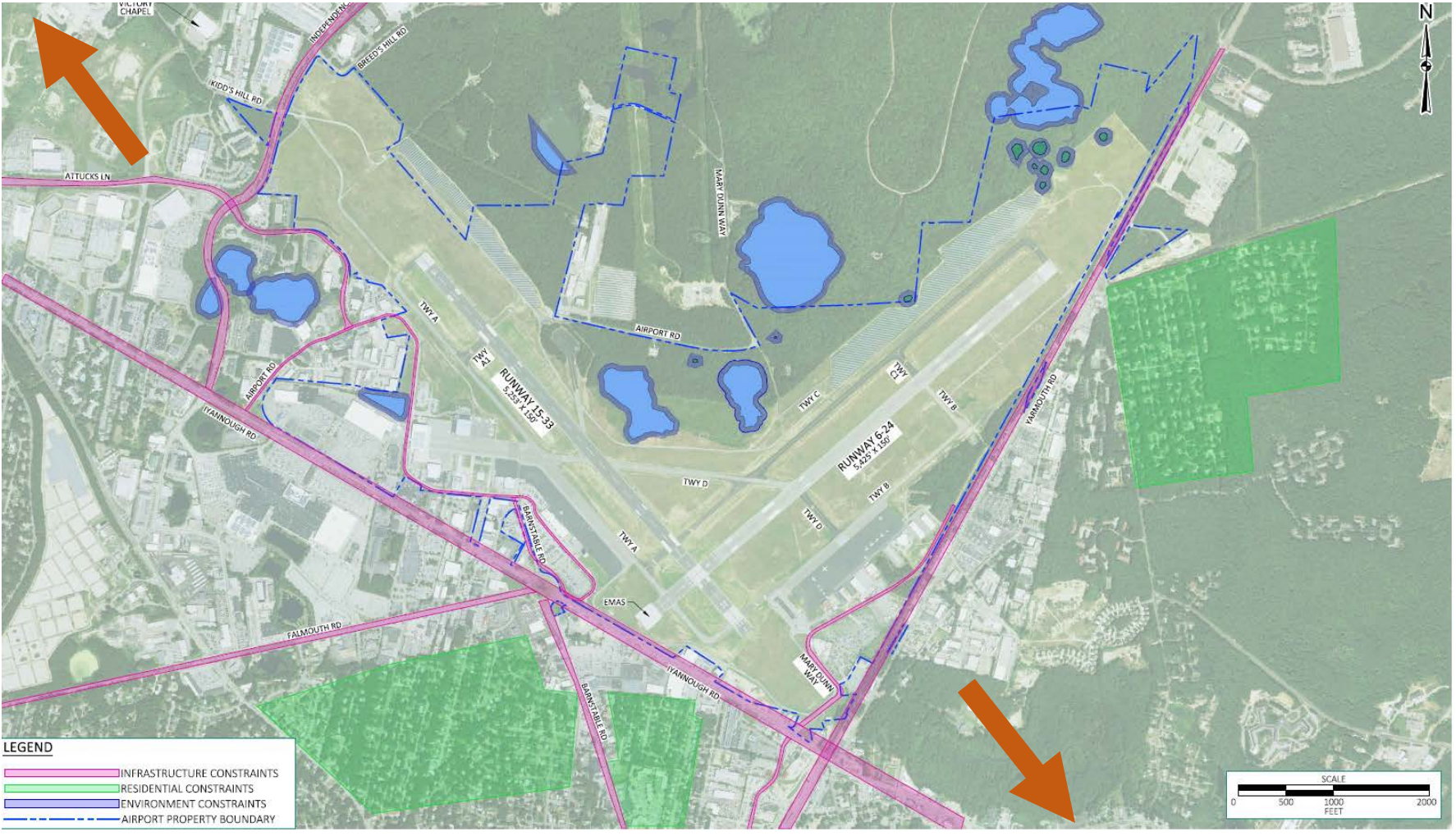




Screening Criteria



Level 1: Existing Physical and Community Constraints



- Runway 6
  - Iyannough Road
  - Residential Dwellings
- Runway 15
  - Independence Drive
- Runway 24
  - Railroad Tracks
  - Yarmouth Road
  - Wetlands
- Runway 33
  - Iyannough Road
  - Yarmouth Road
  - Railroad Tracks
  - Residential Dwellings

Barnstable Village (NW) and Hyannis Park (SE) are also Community Constraints Beyond Immediate Vicinity

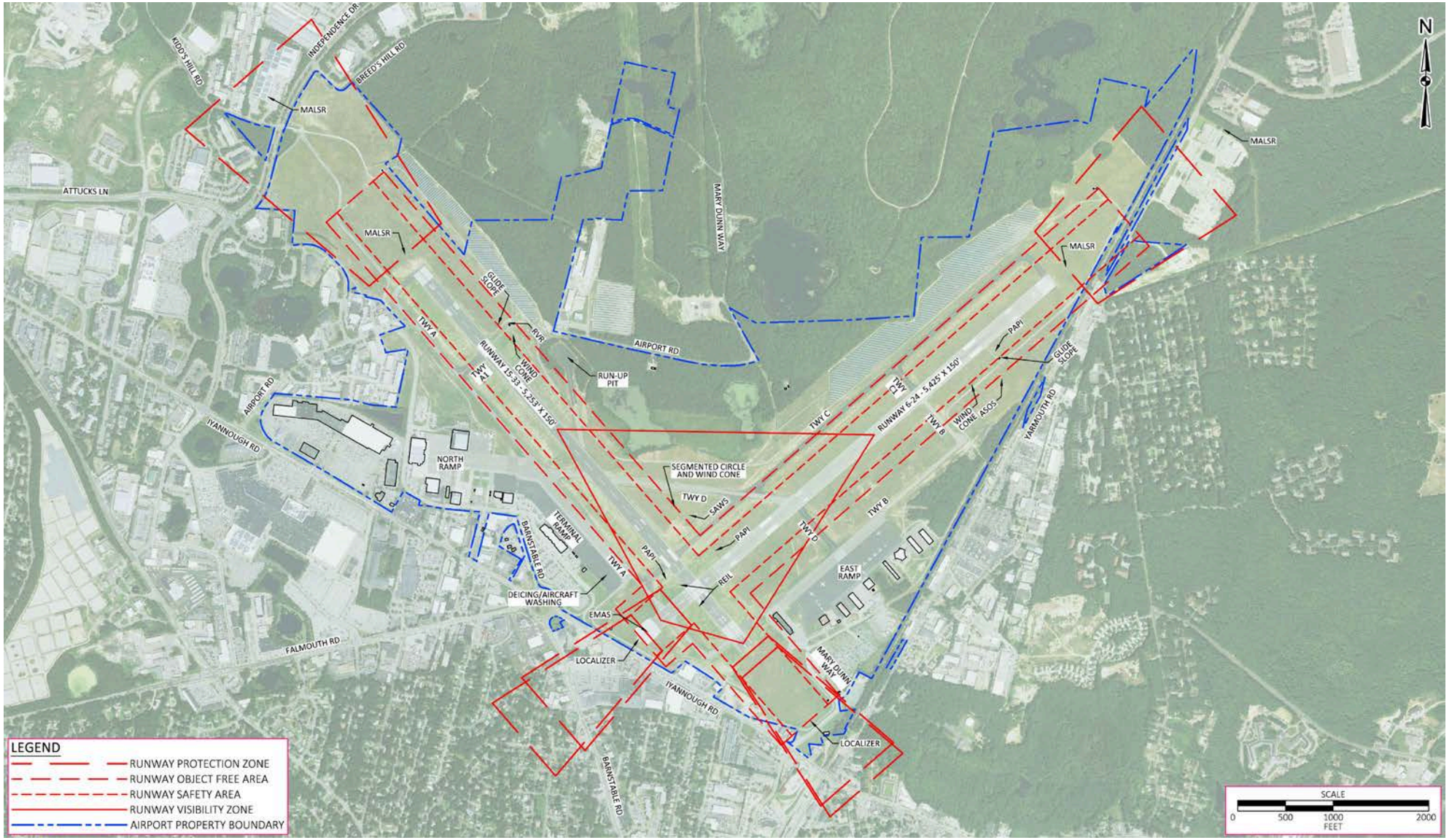
Level 1: Screening Criteria

Level 1 Screening: Existing Constraints
Residential Areas, Road Relocation, Railroad Relocation, or Runway Realignment

Alternatives Considered and Eliminated

- Runway 24 Extension Due to Road and Railroad Track Constraints
- Runway 6 Extension Due to Residential and Road Constraints and Relocation of the EMAS
- Runway 15 RSA Off Airport Property Due to Road Constraints

Level 2: No Build



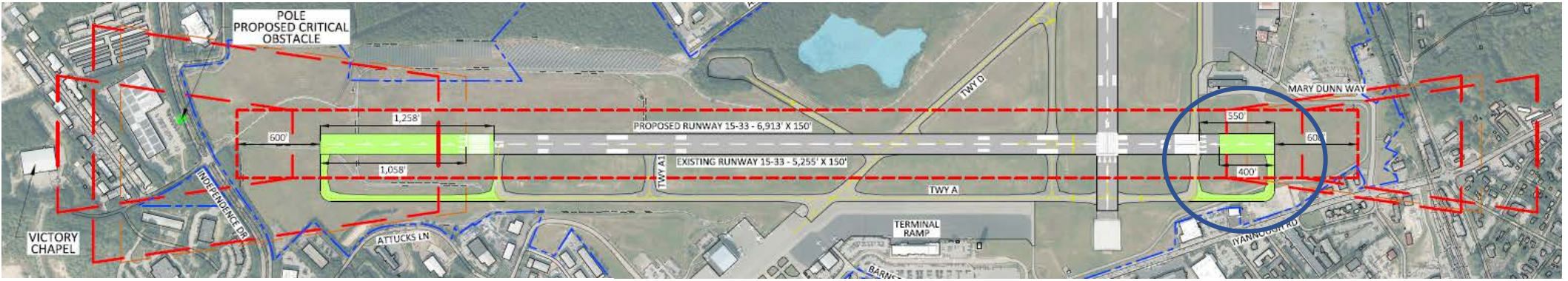
Level 2: Runway 15-33 Alternatives

Meets All Facility Requirements

Pro:
- ✓ Meets Facility Requirements (6,000’ ASDA & LDA)

Cons:
- ✗ Obstructions
- ✗ Incompatible Land Use

Reduced Obstructions and Land Use Impacts (Similar to 2000/2008 Master Plan)



Pro:
- ✓ Minimal Obstructions
- ✓ Compatible Land Use

Cons:
- ✗ Runway 15 Land Distance <6,000’

Meets Most Requirements, Lower Impact

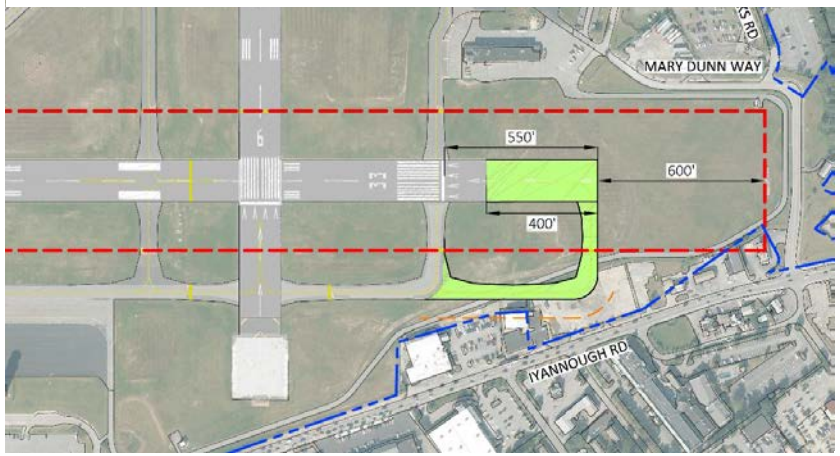
Pro:
- ✓ Minimal Obstructions
- ✓ Compatible Land Use

Cons:
- ✗ Runway 15 Land Distance <6,000’

Level 2: Runway 15-33 Alternatives Enhancements

Runway Access Taxiway

Runway 33 – Standard Access Taxiway



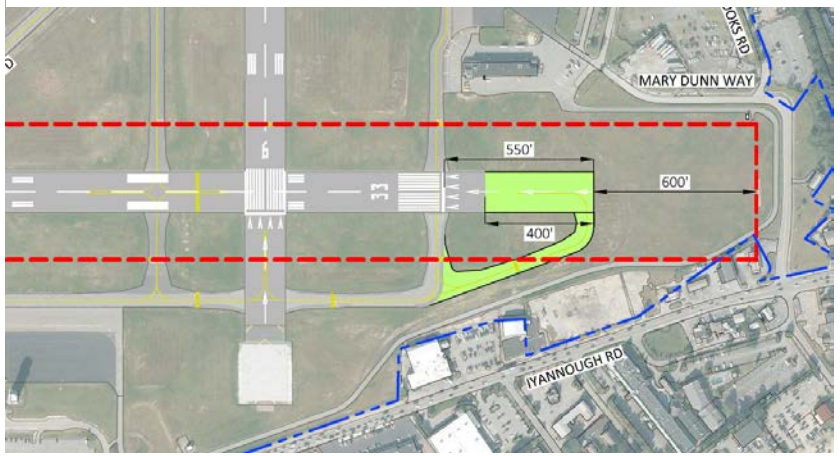
Pro:

✓ Meets Standards

Con:

✘ Requires Property Acquisition

Runway 33 – Optimized Access Taxiway



Pros:

✓ Improves Visibility of Approach Areas

✓ No Property Acquisition

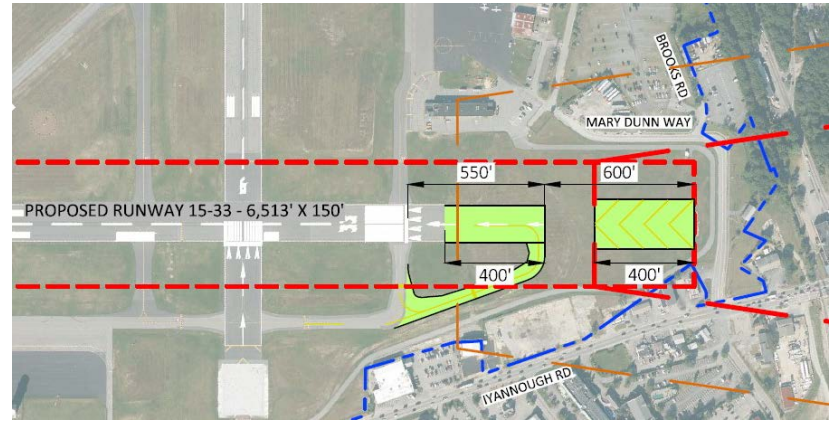
Con:

✘ Does Not Meet Geometry Standards

Other:

= Mitigation Opportunities With Additional Signage, Marking, and Lighting

EMAS



Pros:

✓ Increases Runway 15 Accelerate Stop Distance Available (Rejected Take Off) by 400 Feet

✓ Increases Runway 15 Landing Distance Available by 400 Feet

Con:

✘ Cost

Level 2: Runway 15-33 Alternative Comparison

Evaluation Criteria	No Build	Meets Facility Requirements	Reduced Obstructions and Land Use Impacts	Meets Most Requ'ts, Lower Impact
Meets FAA Standards	Yes	On-Airport: Yes Off-Airport: No, Incompatible Land Use	Yes	Yes
Meets Facility Requirements	No	Yes	Yes – Runway 33 Improves – Runway 15 LDA 200 feet	Yes – Runway 33 Improves – Runway 15 LDA 200 feet
Constructability	N/A	Obstructions Property Acquisition	Yes – Minimal Obstructions; Excess Runway Length	Yes – Minimal Obstructions

Legend	
Best	
Better	
Not Ideal	

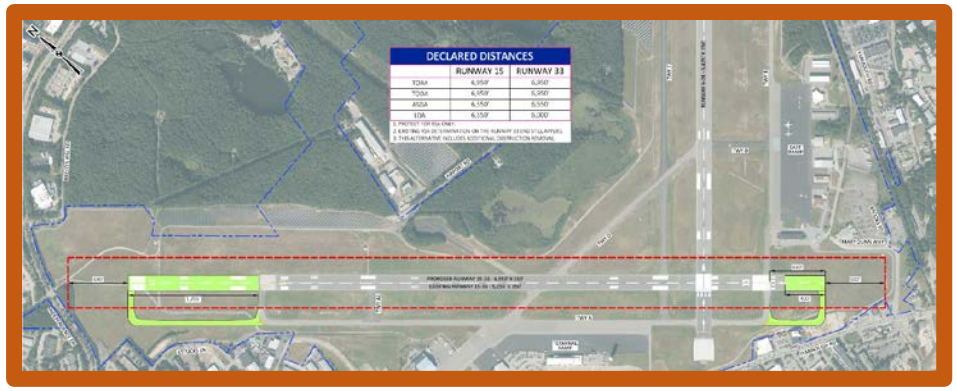
Evaluation Criteria	Standard TWY	Optimized TWY	EMAS
Meets FAA Standards	Yes	No	Yes
Meets Facility Requirements	Yes	Yes	Yes, Improves Runway 15 LDA
Constructability	Property Acquisition	Yes	Yes

Level 2: Runway 15-33 Screening Criteria

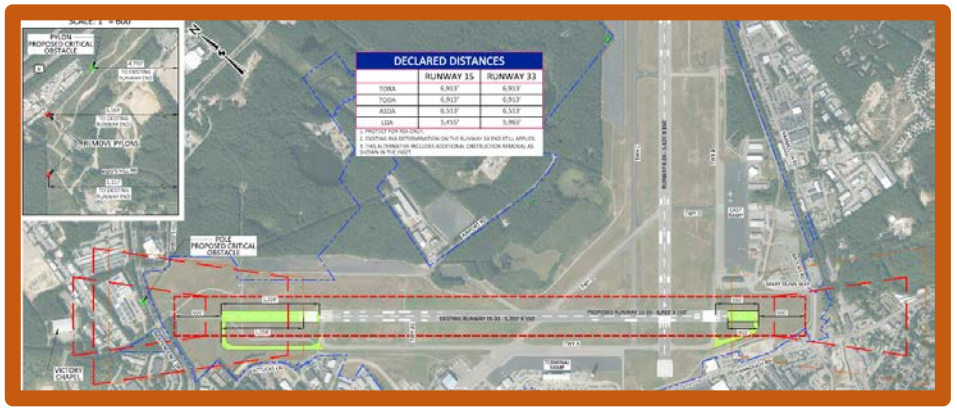
Level 2 Screening: Meets Facility Requirements/FAA Standards and Operational Use On Airport
Meet or Maximize Facility Requirements and FAA Standards. Review for Potential Operational and Constructability Pitfalls.

No Build

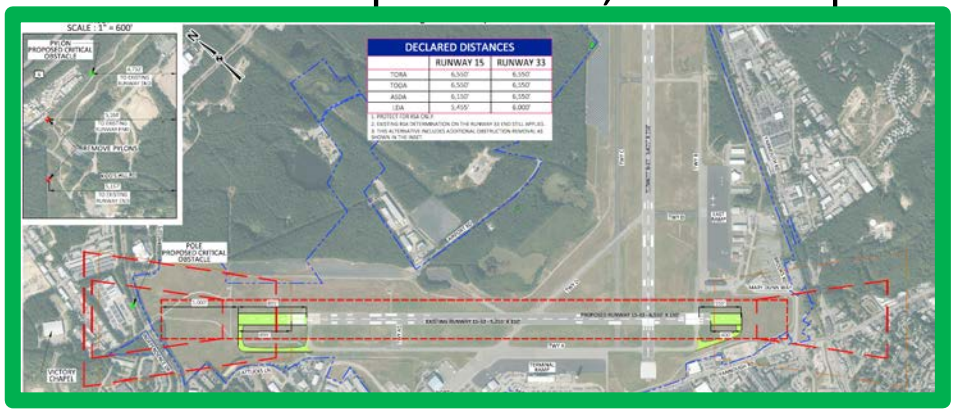
Maximum Build-Out



Reduced Obstruction and Land Use Impacts

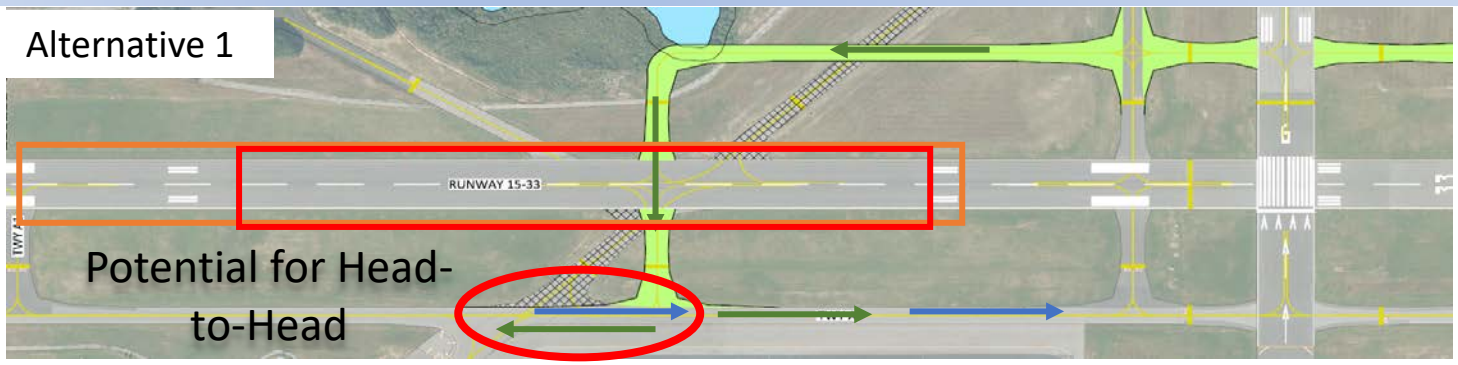


Meets Most Requirements, Lower Impact



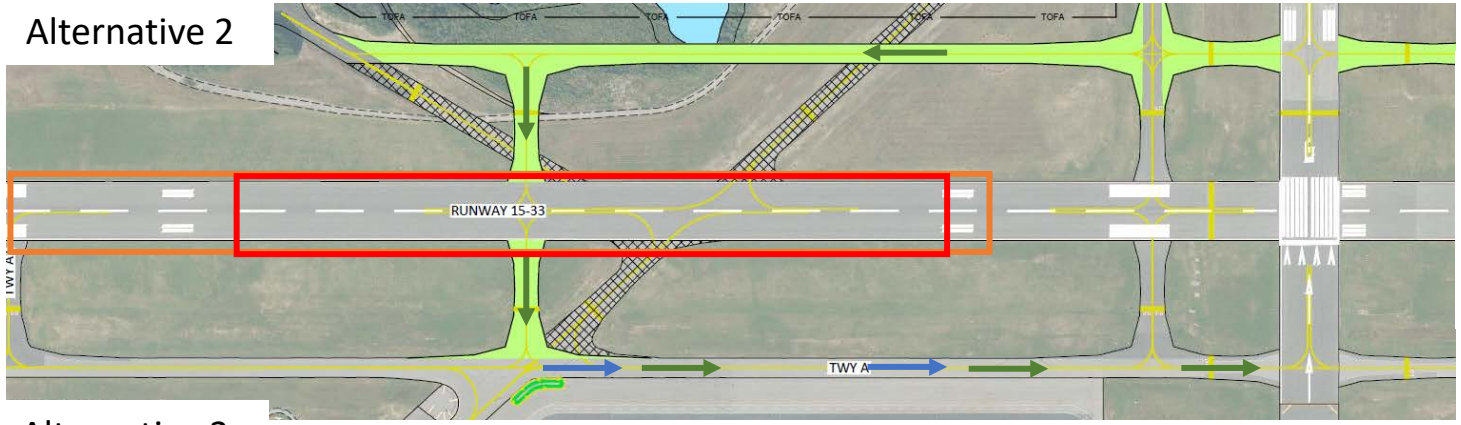
Level 2: Runway 15-33 Taxiway D Alternatives

Alternative 1



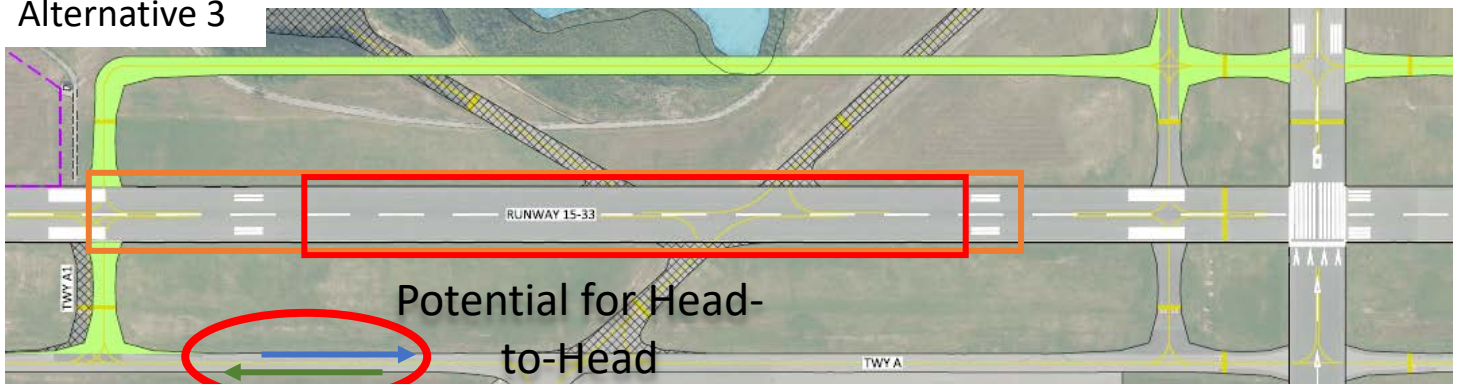
- ✓ Eliminates 1 Non-Standard Condition
- ✓ Opens Land for Potential Use
- ✗ Creates Operational Choke Point
- ✗ Does Not Resolve 3 Non-Standard Geometry Conditions

Alternative 2



- ✓ Eliminates 3 Non-Standard Conditions
- ✓ Opens Land for Potential Use
- ✗ Does Not Resolve 1 Non-Standard Geometry Condition

Alternative 3



- ✓ Eliminates 3 Non-Standard Conditions
- ✓ Opens Land for Potential Use
- ✗ Does Not Resolve 1 Non-Standard Geometry Condition
- ✗ Increases Taxiing and Maneuvering Time
- ✗ Creates Operational Choke Point

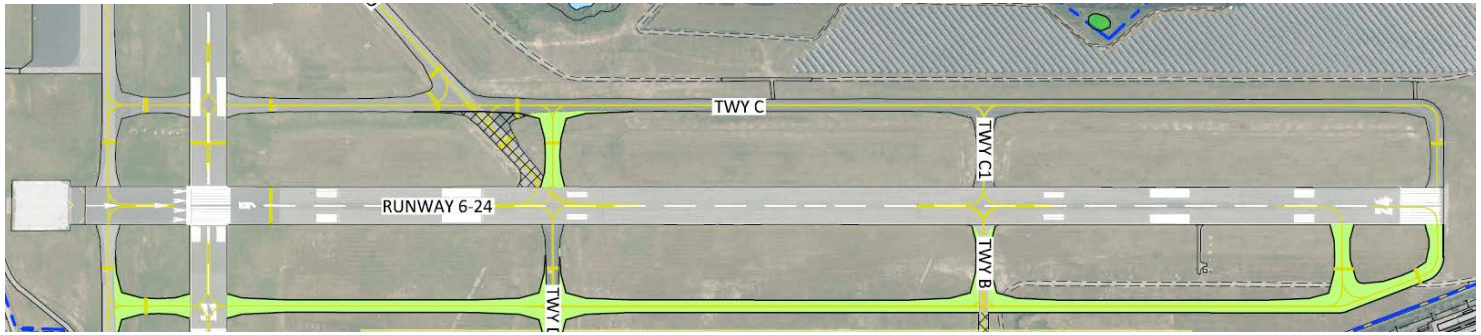
Level 2: Runway 6-24 Taxiway B and High Energy Alternatives

Alternative 1

Pros:

- ✓ Meets Runway-Taxiway Separation
- ✓ Eliminates High-Energy Intersections
- ✓ Creates 90-degree Intersections
- ✓ Opens Aviation Development Area

Alternative 2



Pros:

- ✓ Meets Runway-Taxiway Separation
- ✓ Creates 90-degree Intersection at Taxiway D
- ✓ Opens Aviation Development Area

Cons:

- ✗ Does not Meet Geometry Standards

Level 2: Taxiway Alternative Comparison

Evaluation Criteria	No Build	TWY B RWY-TWY Separation	TWYs B/C1 and D High Energy Alt 1	TWYs B/C1 and D High Energy Alt 2
Meets FAA Standards	No	Yes	Yes	Fixes Taxiway D Angle Still Has High Energy Crossings
Meets Facility Requirements	No	Yes	Yes	Yes
Operational Impacts	None	None	None	None
Constructability	N/A	Yes	Yes	Yes

Legend	
Best	
Better	
Not Ideal	

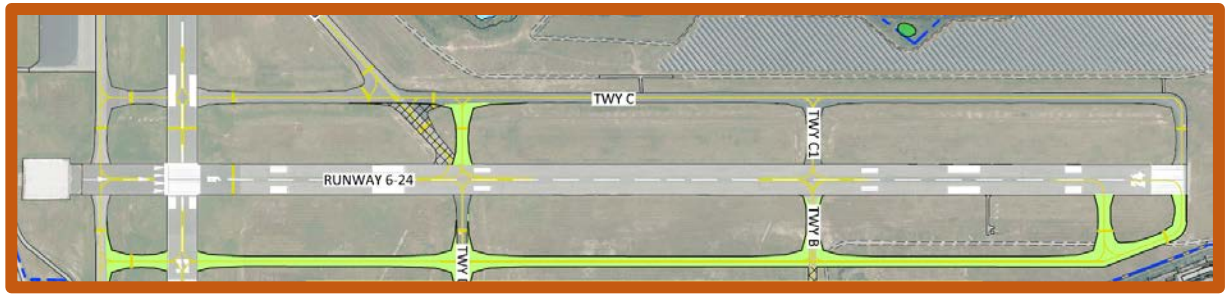
Level 2: Taxiway Screening Criteria

Level 2 Screening: Meets Facility Requirements/FAA Standards and Operational Use On Airport Meet or Maximize Facility Requirements and FAA Standards. Review for Potential Operational and Constructability Pitfalls.

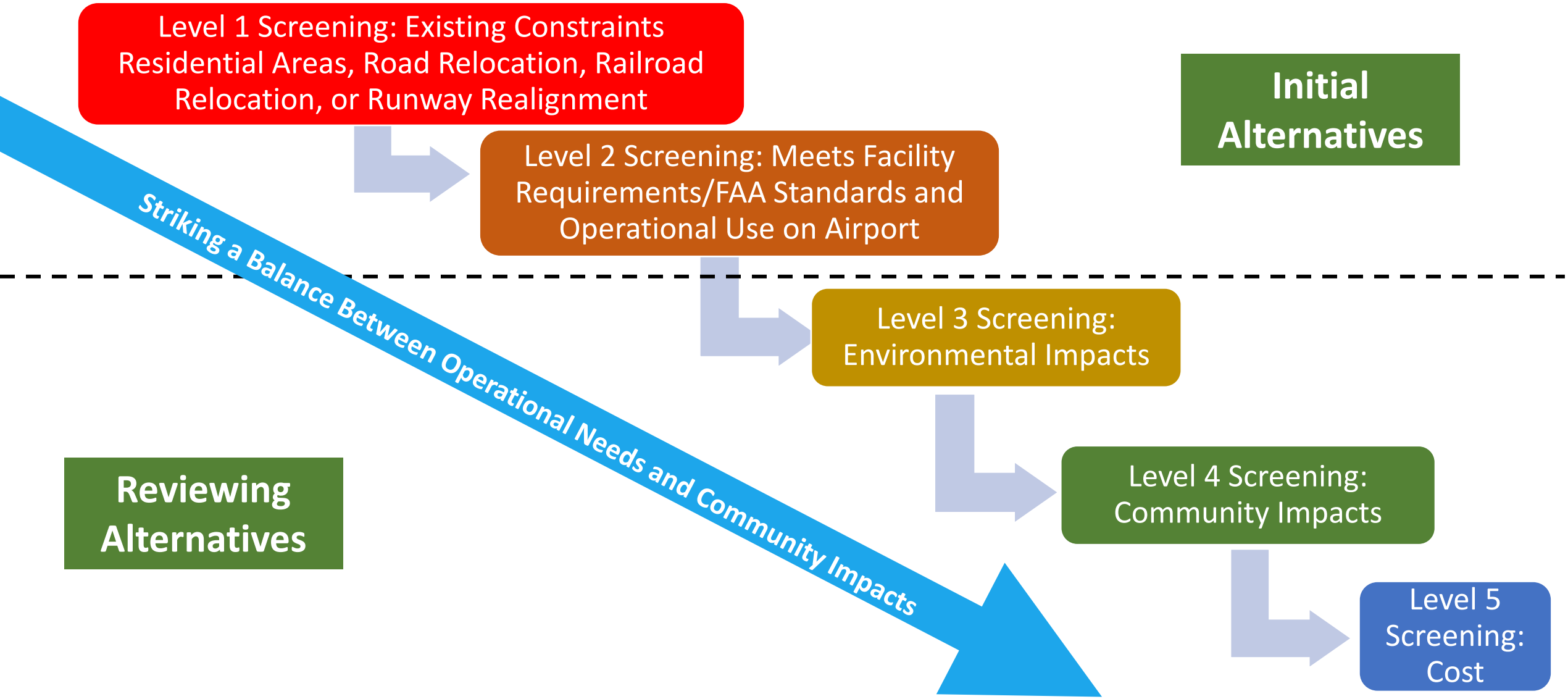
No Build

Taxiway B and High-Energy Alternative 1

Taxiway B and High-Energy Alternative 2



Screening Criteria

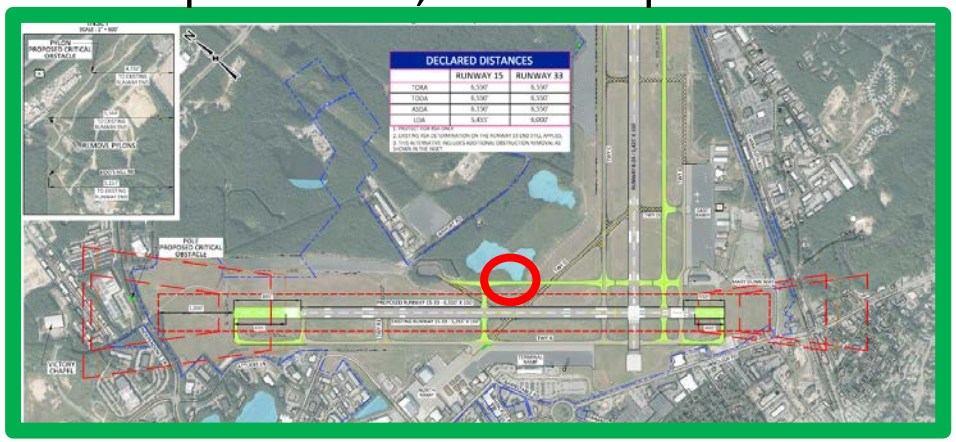


Level 3: Environmental Screening

Level 3: Airside Screening Criteria

Level 3 Screening: Environmental Impacts to Wetlands, Vernal Pools, Habitats of Rare Species/Wildlife

Most Requirements, Lower Impact With EMAS



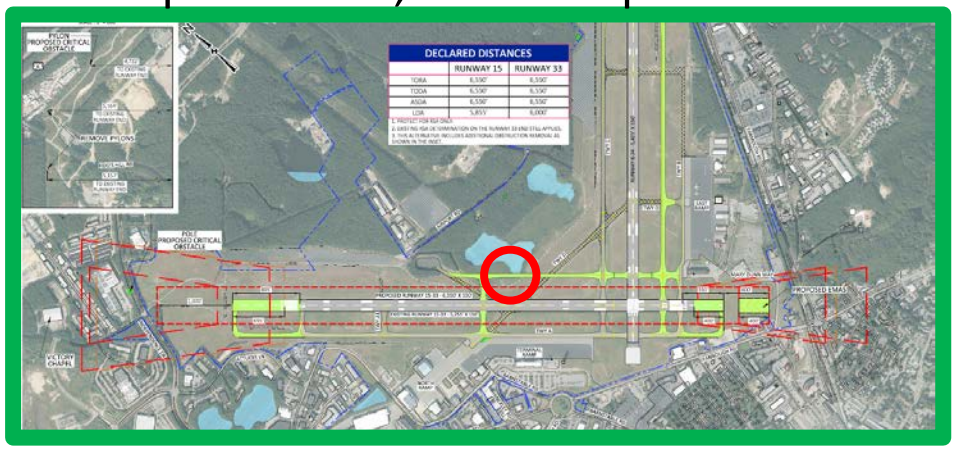
Environmental Impacts:

- ✓ No Vernal Pool Impacts
- ✓ No Habitat of Rare Species/Wildlife Impacts

Cons:

- ✗ 390,000 SF of Additional Pavement (~1.5% more)
- ✗ Wetland/Pond/Local Conservation Commission Impact

Most Requirements, Lower Impact Without EMAS



Pros:

- ✓ No Vernal Pool Impacts
- ✓ No Habitat of Rare Species/Wildlife Impacts

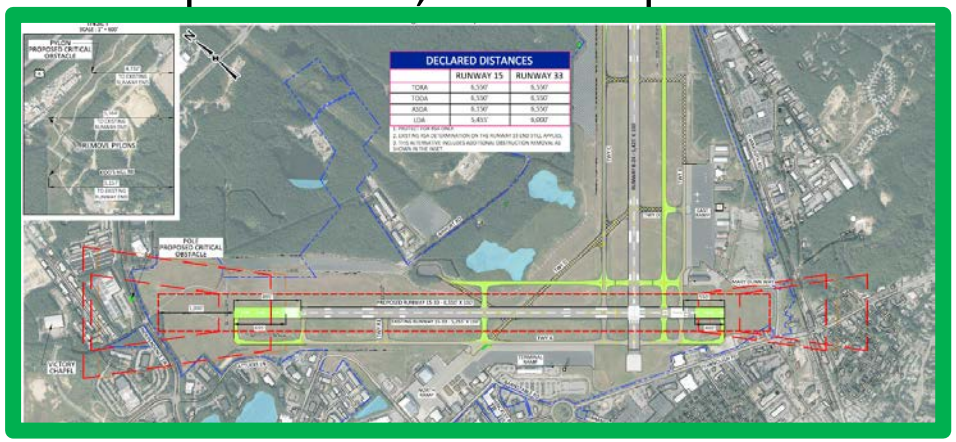
Cons:

- ✗ 310,000 SF of Additional Pavement (~1% more)
- ✗ Wetland/Pond /Local Conservation Commission Impact

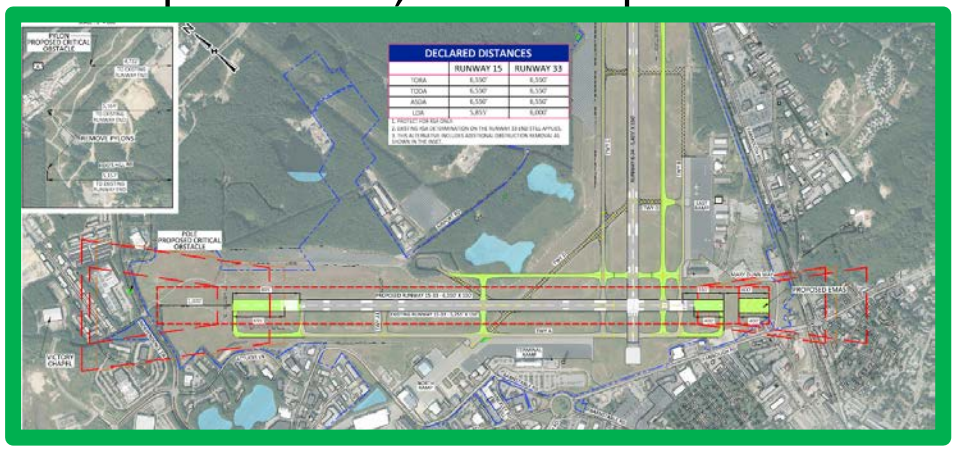
Level 4: Airside Screening Criteria

Level 4 Screening: Community Impacts

Most Requirements, Lower Impact With EMAS



Most Requirements, Lower Impact Without EMAS



These Alternatives Have the Same Common Community Impacts:

Pros:

- ✓ Increased Travel Flexibility and Convenience
- ✓ Aircraft Not Needing Runway Extension Departing Runway 15 Will Be Higher Over Neighborhoods South and East

Con:

- ✘ Aircraft Departing Runway 33 May Be Closer to Neighborhoods South and East

Other:

- = No Change for Aircraft Landing Runway 33

Level 5: Airside Alternative Comparison

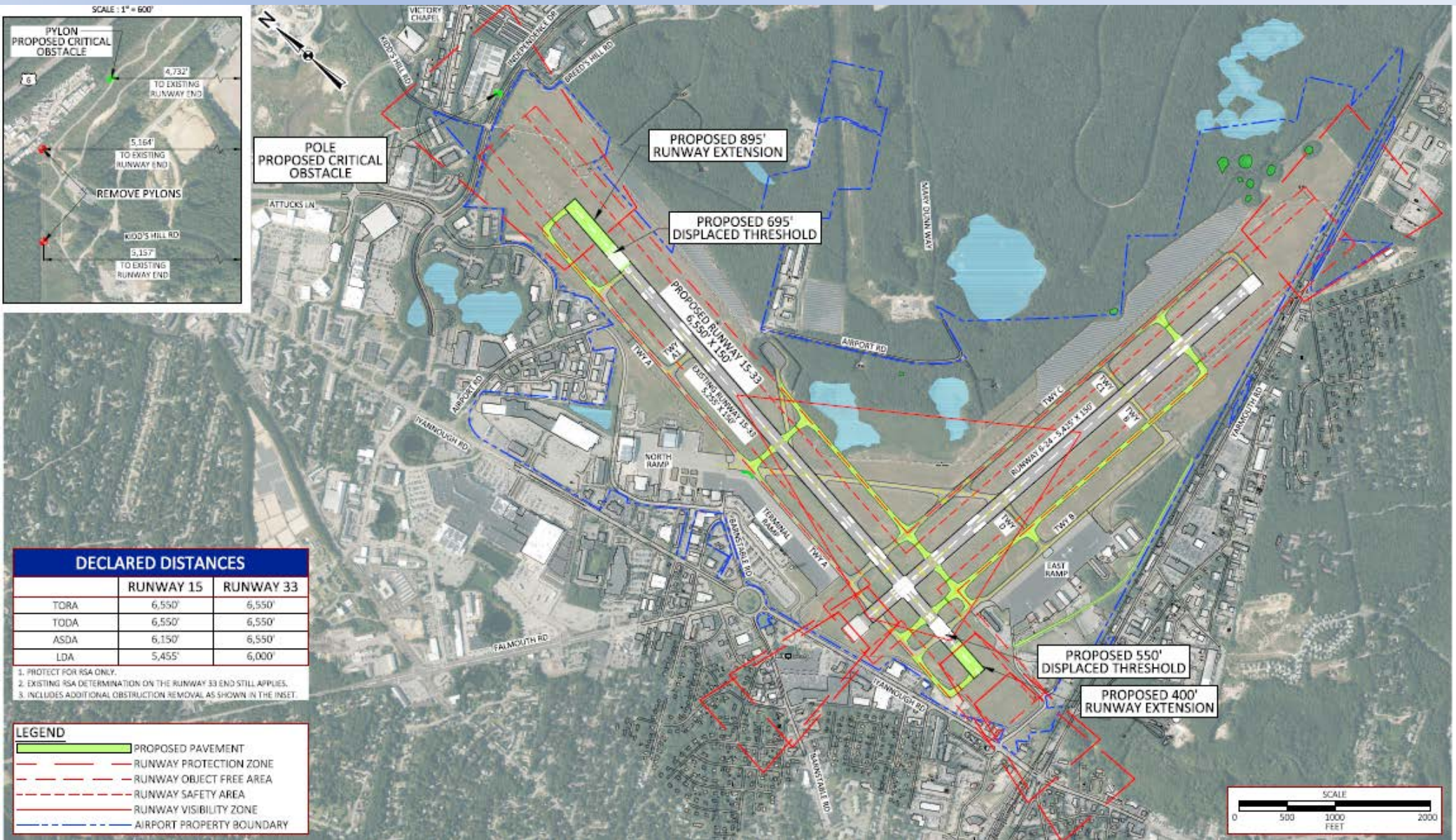
Level 5 Screening: Cost

Evaluation Criteria	Most Requirements, Lower Impact With EMAS	Most Requirements, Lower Impact Without EMAS
Construction Cost	High	Medium
Operational Cost	Medium	Low

Legend	
Best	
Better	
Not Ideal	

The Preferred Alternative Does Not Preclude the EMAS From Being Constructed in the Future

Preliminary Recommendation for ALP



- ✓ Meets FAA Standards, Advanced to NEPA Process for Review
- ✓ Most Aircraft Will Continue to Use the Same Runways
- ✓ Runway 6-24 Continues to Be Primary Visual Conditions Runway
- ✓ Runway 15-33 Continues to Be Instrument/Weather Runway

Recommended Plan: A Balanced Approach

- Existing Runway Supports Limited Number of Commercial Aircraft in the Fleet
- Longer Runway Allows for Modern, Quieter, More Efficient Aircraft
- Growing Off-Season Requires Planning for Winter Ops for both GA & Commercial

Community& Environmental Impacts

- Continue to Lead the Region in Airport Environmental Stewardship
- Minimize and Fully Mitigate for Environmental Impacts
- Seek "Green Opportunities" in Future Projects

Recommended Plan

Operational Safety and Flexibility

Costs and Funding

Community and Regional Benefits

- Cape-Resident and Business Focused Approach
- Proven Cape-Originating need for Air Service
- Upcoming Bridge Replacement will Highlight needs for Additional Transportation Links
- Only Jet-Capable Gateway for Cape Business and Residents

Terminal Area Alternatives

Passenger Terminal Facility Requirements

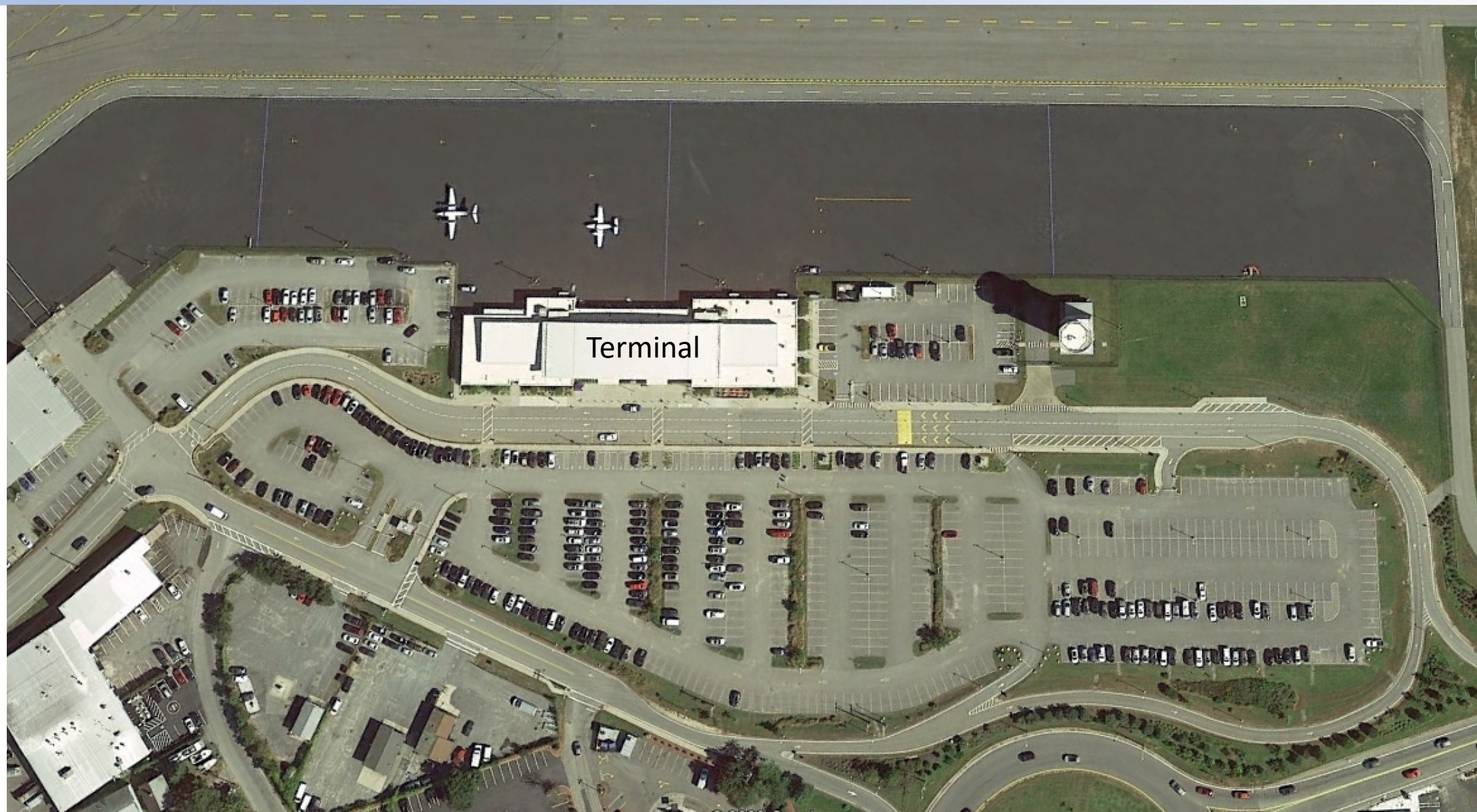
Terminal Functional Area	Existing Provision	150 Passengers	200 Passengers
Check-In / Ticketing	3,670	1,446	1,897
Outbound Baggage Screening & Makeup	2,000	3,240	3,240
Passenger Security Screening Checkpoint	2,305	4,981	6,366
Secure Holdrooms	2,550	6,878	9,072
Baggage Claim and Inbound Baggage Handling	1,338	4,292	8,820
Non Secure Areas	5,065	3,329	4,814
Other Functions/Tenants	13,645	15,644	17,871
Total Passenger Terminal Area Requirement	30,573	39,810	52,080
Passenger Terminal Area Requirement Range		35,000-40,000	50,000-55,000

Recommendation Priorities:

1) Expand Baggage Claim Area
2) Expand Secure Holdroom
3) Expand Security Checkpoint
4) Expand Outbound Baggage Screening Area (In-line System)

Total Additional Space - 5,000-25,000 SF

Terminal

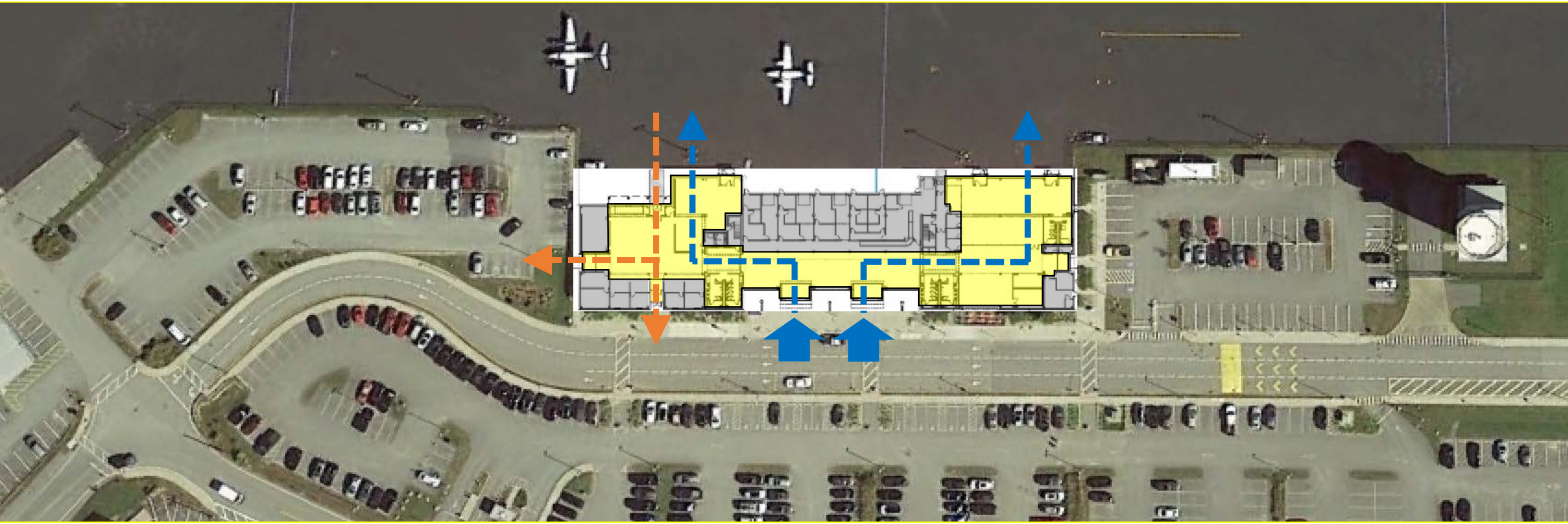


Existing Terminal

Public space

Support space non-public

Existing Terminal



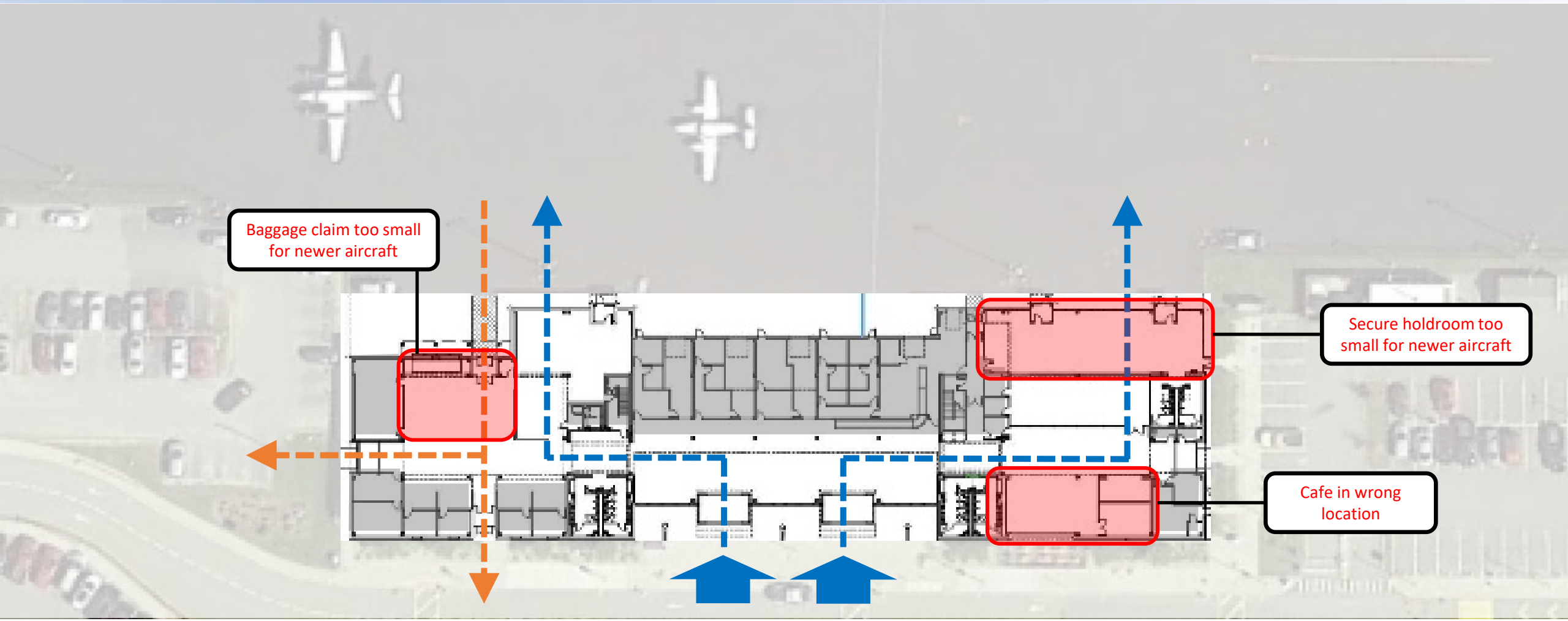
Public space

Support space non-public

Departing Passengers

Arriving passengers

Existing Terminal Issues



Alternatives

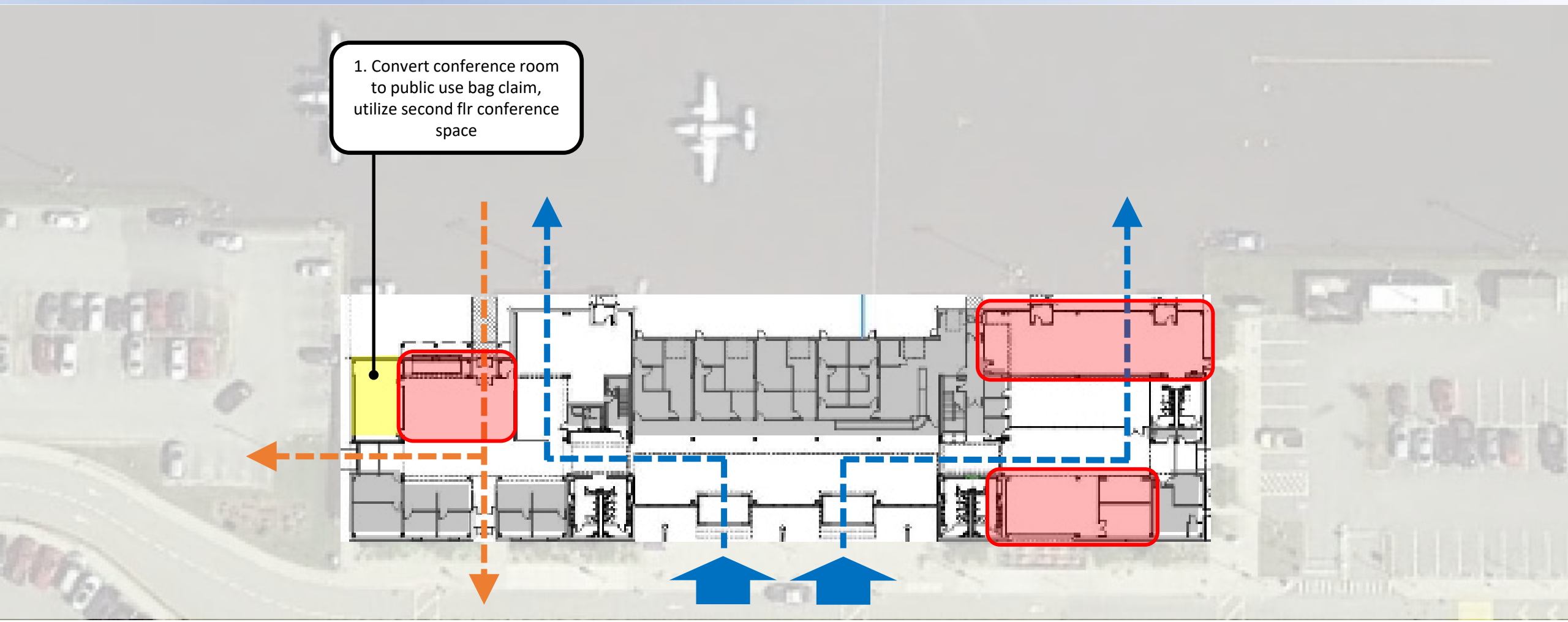
ALTERNATIVE A:

- **Medium term**: Reconfigure within existing footprint to address current deficiencies.
- **Long term**: Preserve ability for expansion at terminal ends if necessary.

ALTERNATIVE B:

- **Medium term + Long Term**: Expand existing footprint to address current deficiencies.

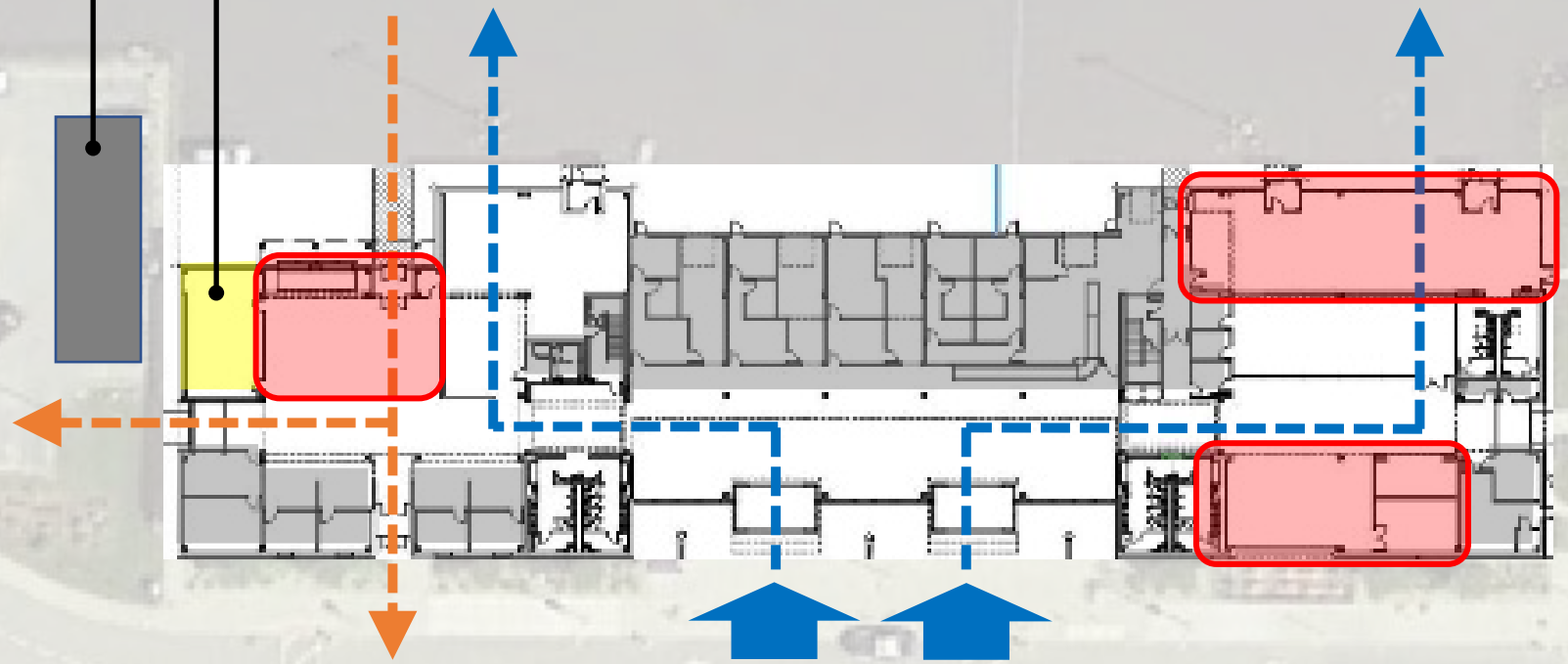
Alternative A: Preferred



Alternative A: Preferred

2. Install cost-effective modular unit for new car rental offices/lobby in parking lot

1. Convert conference room to public use bag claim, utilize second flr conference space



Public space

Support space non-public

Departing Passengers

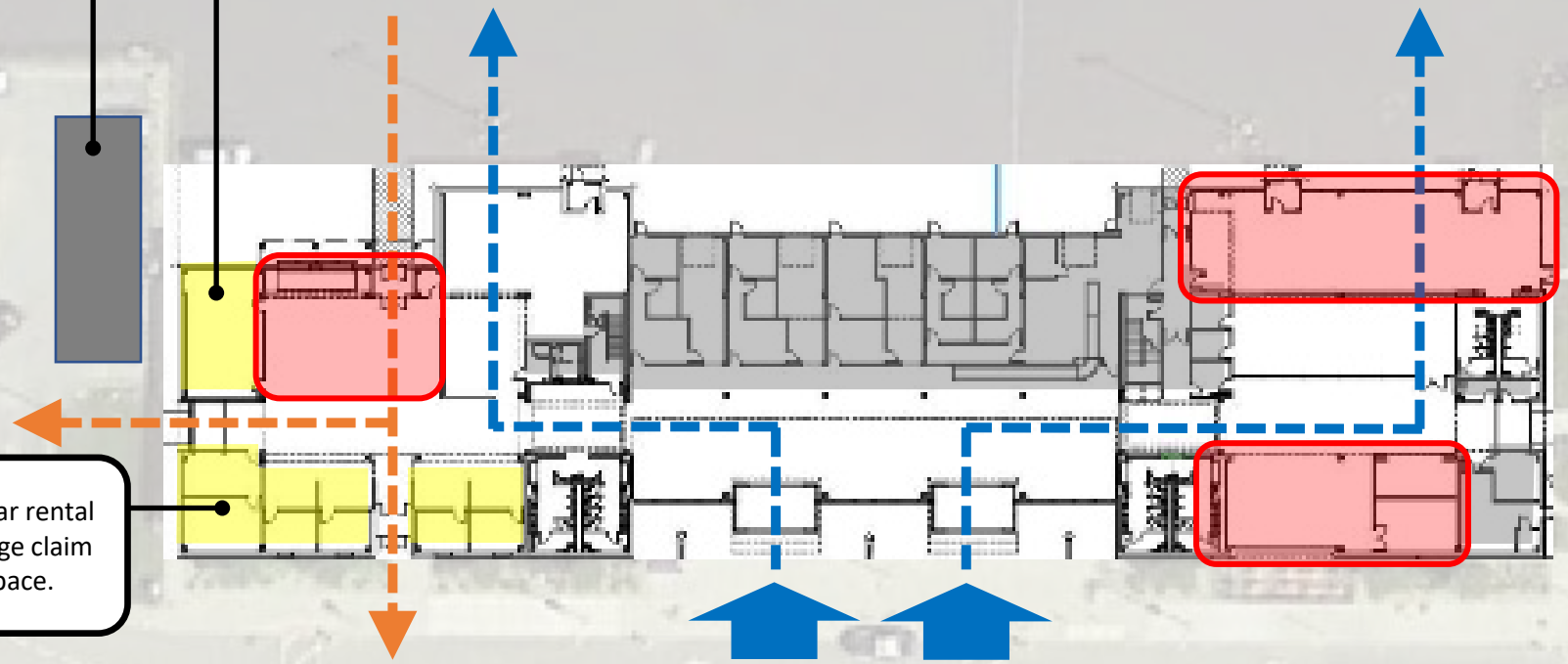
Arriving passengers

Alternative A: Preferred

2. Install cost-effective modular unit for new car rental offices/lobby in parking lot

1. Convert conference room to public use bag claim, utilize second flr conference space

3. Convert existing car rental area to public baggage claim / arrivals lobby space.



Public space

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Departing Passengers

Arriving passengers

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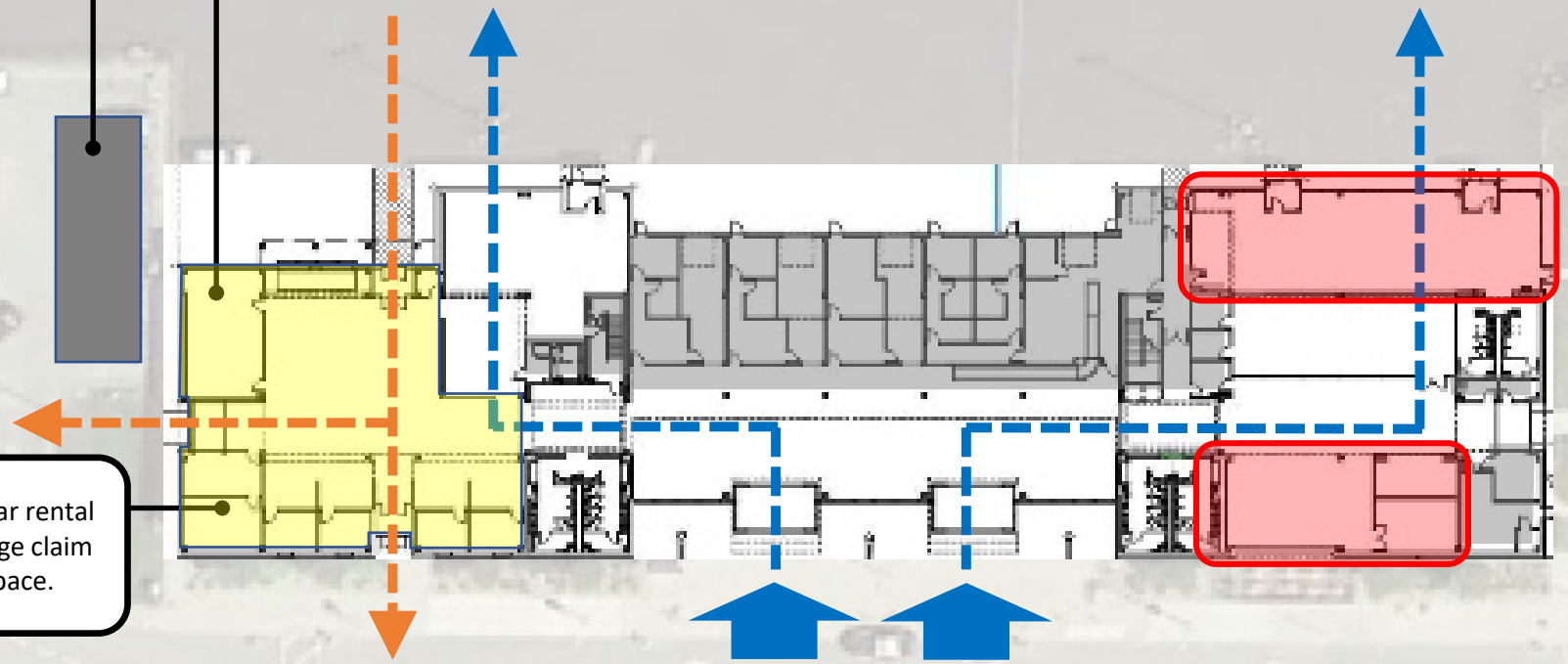


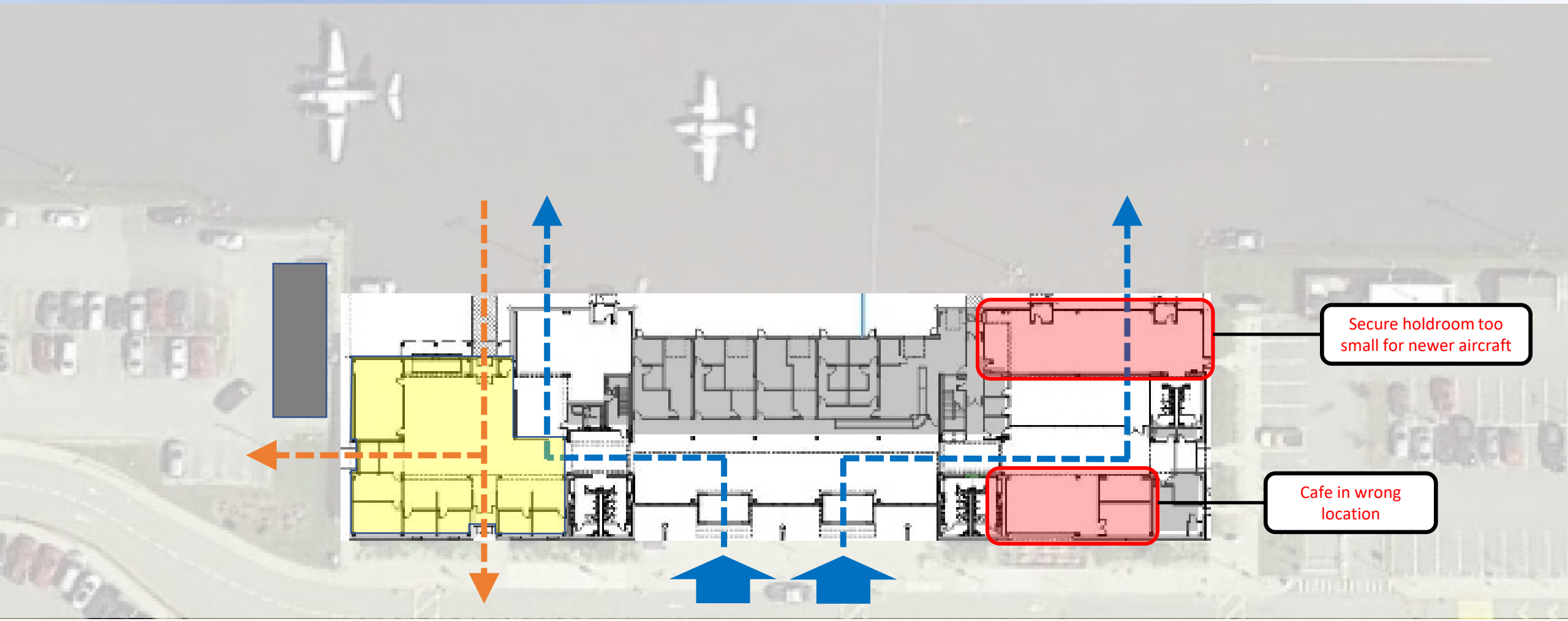
Public space

Support space non-public

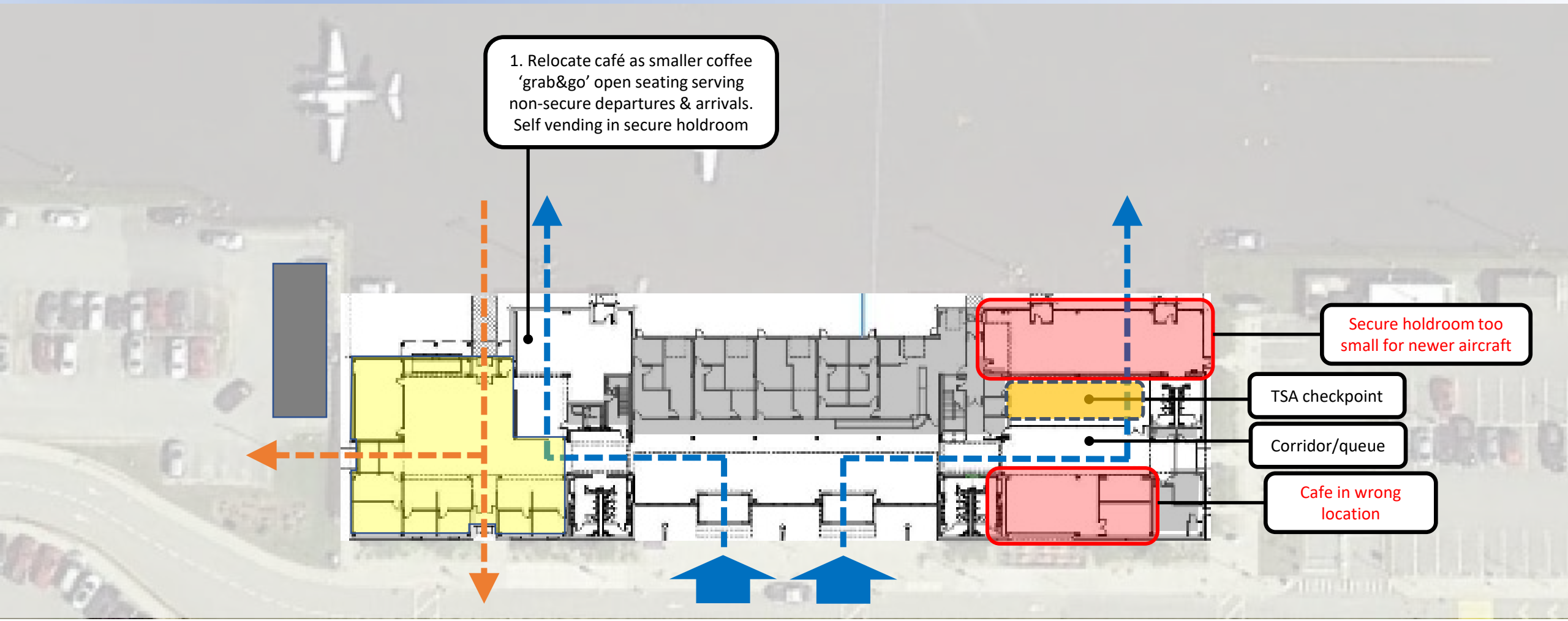
Departing Passengers

Arriving passengers

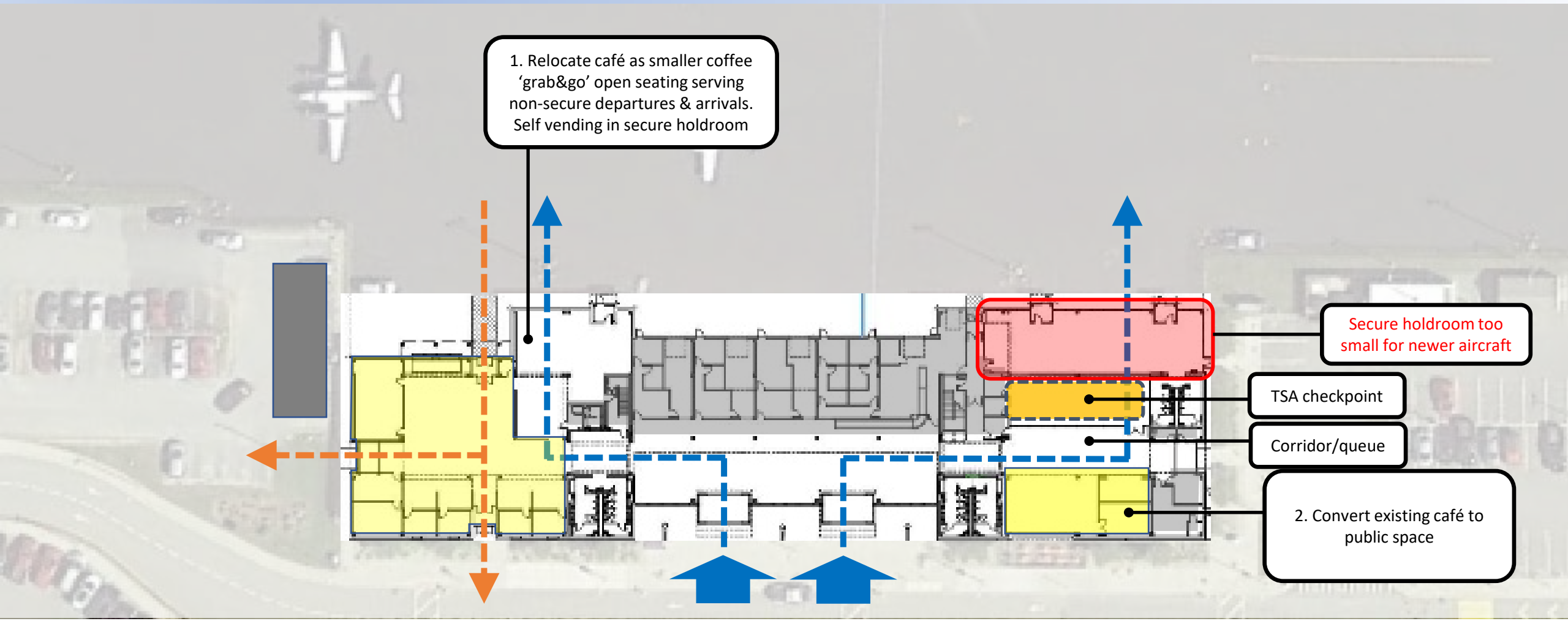
Alternative A: Preferred



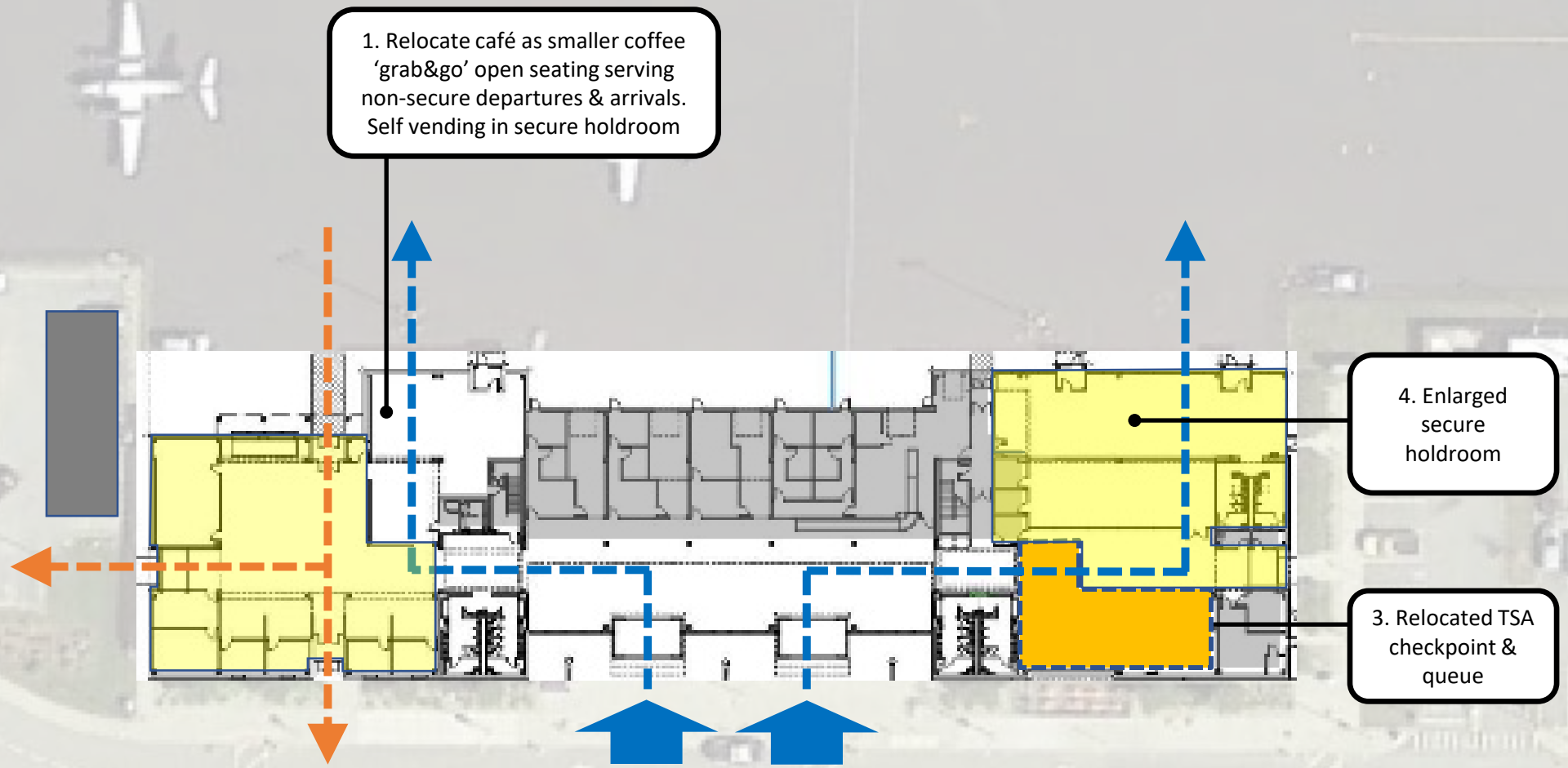
Alternative A: Preferred



Alternative A: Preferred



Alternative A: Preferred



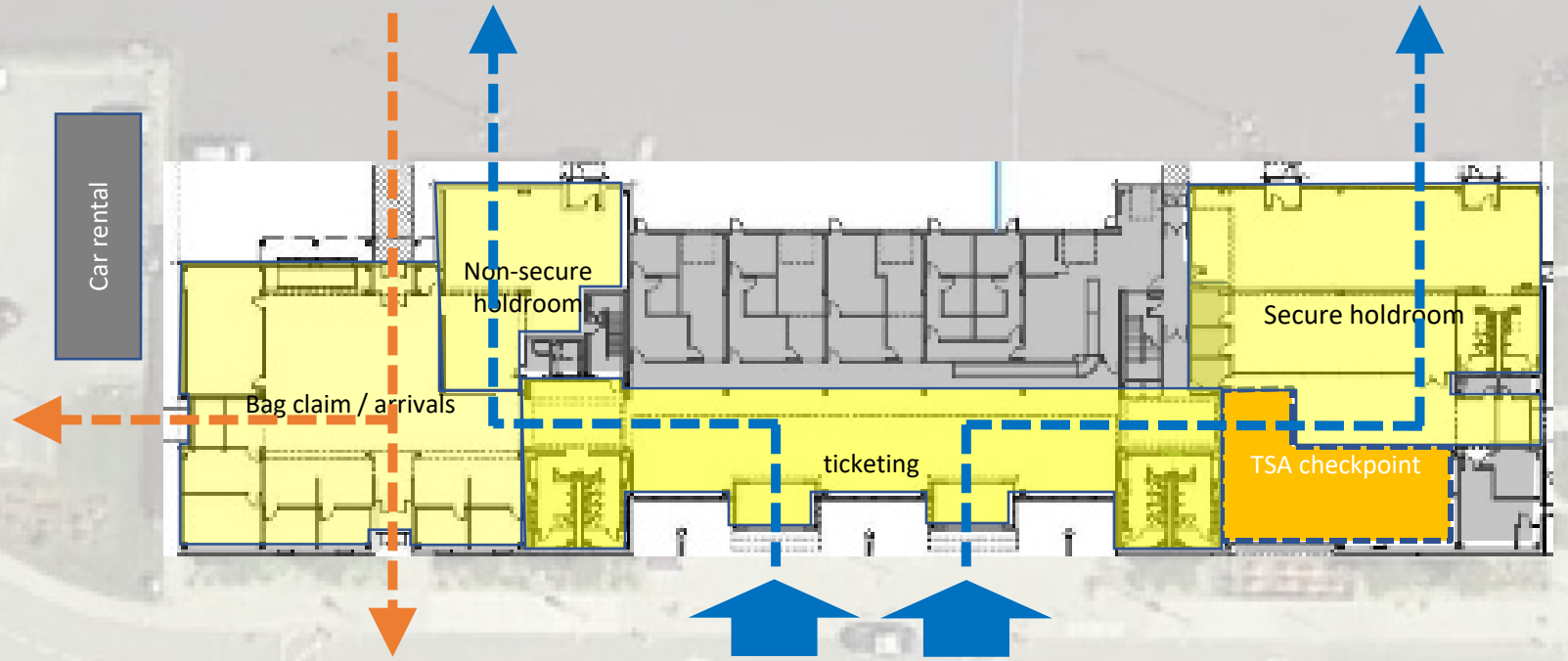
Public space

Support space non-public

Departing Passengers

Arriving passengers

Alternative A: Preferred



ALTERNATIVE A FEATURES:

- More efficient use of existing space
- More than double size of deficient public spaces without need for major expansion
- Required added support space via cost-effective modular building
- Preserves options for future as needs arise

Public space

Support space non-public

Departing Passengers

Arriving passengers

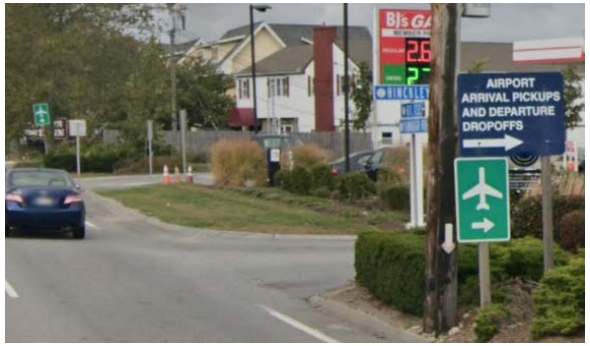
General Aviation, Landside & Support Alternatives

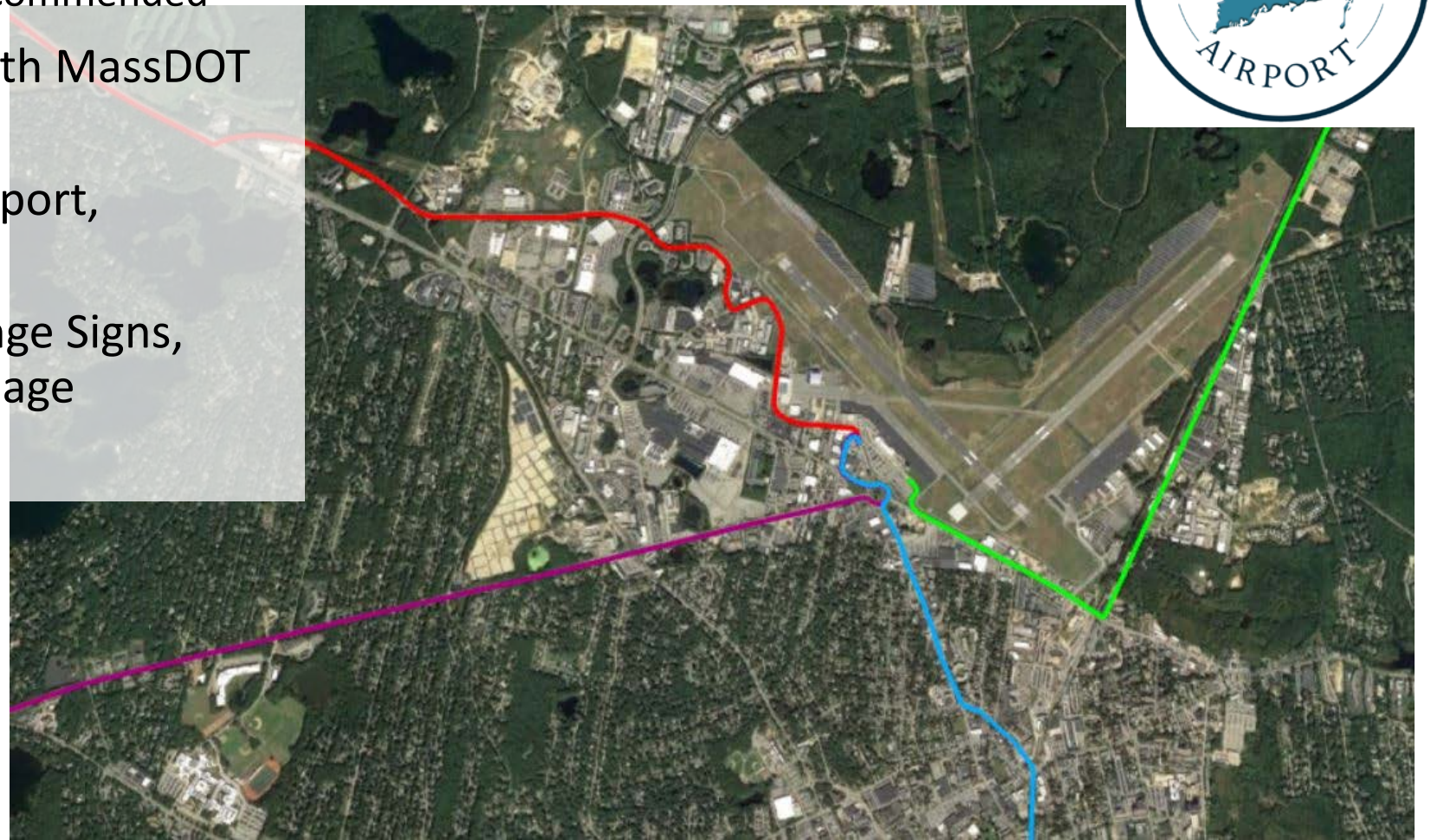
Landside, GA, & Support Facilities Requirements Summary

Item/Facility	Demand
Airport Access	Improve Wayfinding, Simplify Routes
Hangars (Demand Based)	Plan for 6 Additional Individual Hangars and up to 8 New Conventional Hangars (various sizes)
GA Ramps (Demand Based)	423,000 SF of Transient Ramp Space
Fueling (Demand Based)	Potential Need for Additional Jet-A Tank, Provide Self-Service 100LL Option, Plan Location/Parking for Electric Aircraft (Up to 6 Itinerant Group II)
SRE/ARFF/Maintenance	Expand Building, Update and Repair Facility

Airport Access

- Airport Funds Cannot Be Used for Any Roads off Airport Property
  - A Stand-Alone Signage Study is Recommended
- Airport Advocates For Changes With MassDOT and Town of Barnstable
- Coordinated Solution Between Airport, MassDOT, and Town of Barnstable
- Name Change of Airport Will Change Signs, Opportunity for Branding and Signage Standardization

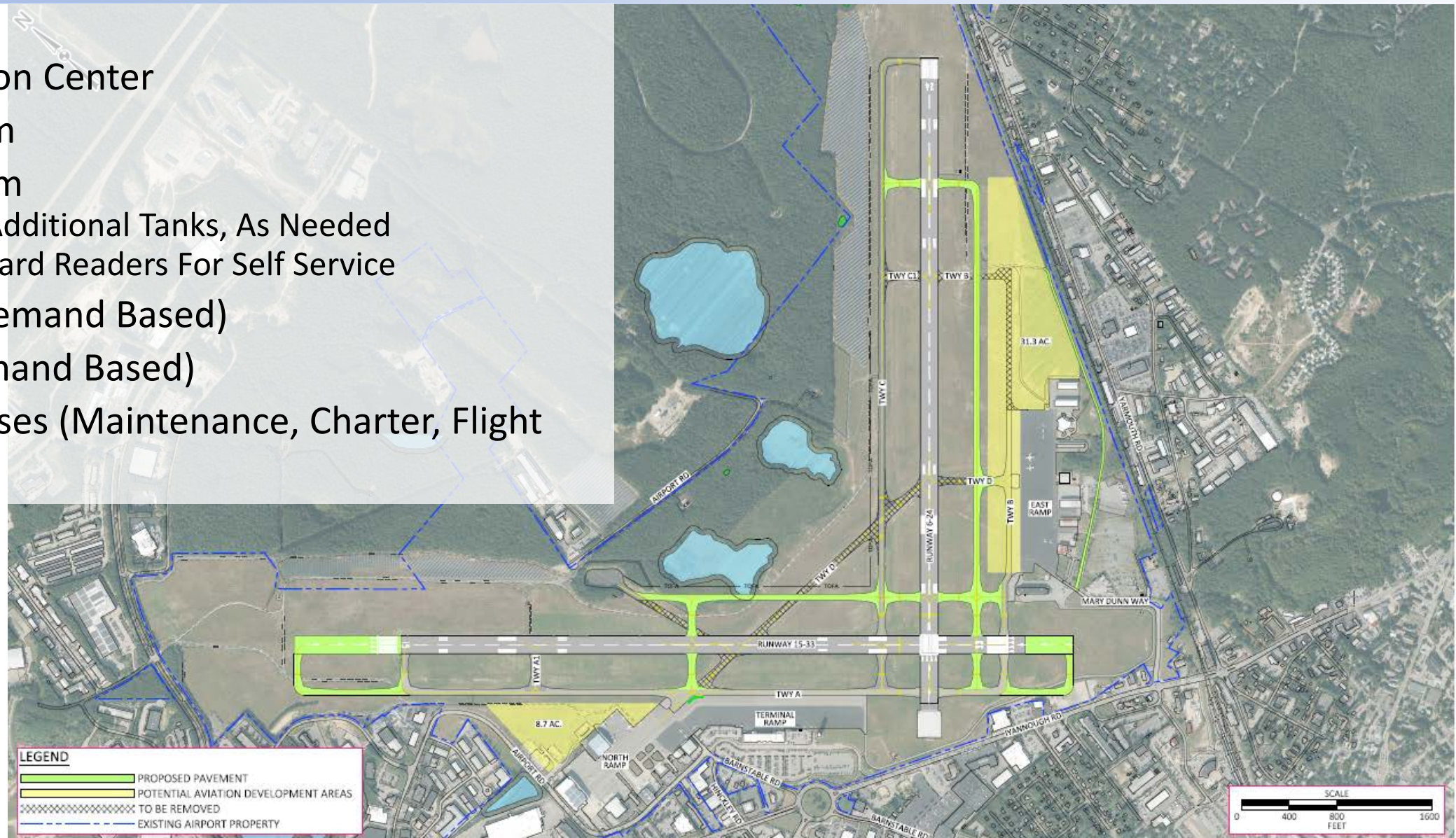




General Aviation Development Areas

Potential Uses:

- Aviation Education Center
- Aviation Museum
- Existing Fuel Farm
  - Plan For Two Additional Tanks, As Needed
  - Install Credit Card Readers For Self Service
- New Hangars (Demand Based)
- New Apron (Demand Based)
- Aviation Businesses (Maintenance, Charter, Flight School)



Green Opportunities

- Install Electric Aircraft Charging Stations
  - West Side/Near the Terminal
  - North Side of East Ramp
- Install Electric Vehicle Charging Stations
- Install Solar Panels
  - Parking Lot Awnings
  - Roofs
- Continued Coordination With Cape Cod Commission

Next Steps

What's Next?

- Review FAA Comments on Facility Requirements & Alternatives Chapters
- Public "Meeting" – Web Based
- Review Comments/Revise Alternatives
- Preferred Alternative
- Implementation Plan
- **Next PAG Meeting – March 2021: *HYA Implementation Plan***
- FAA Airport Layout Plan Approval and Master Plan Completion

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- NEPA/Environmental Process and **Continued Public Involvement**

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Questions